Excavating Engineer

founded 1905

• Along relocated U. S. Highway 2 atop South Coulee Dam, near Coulee City, Wash., Spartling Tool Co., Seattle and Spokane, puts down post holes for guardrail with rig made in part from Civil War cannon. See story, page 24.

January 1949

. . . To Put the Pieces Together!

. . . And in building a dredge to meet today's placer mining requirements, you can depend on the skill and experience of Bucyrus-Erie—a company which has built only the best since 1884!

The modern Bucyrus-Erie placer dredge begins with *you* . . . is designed specifically to handle the work you have, at peak efficiency under your operating conditions. Bucyrus-Erie engineers work closely with you to find the best solution for your dredging problems, and their designs are transformed into reality by skilled workmen, up-to-the-minute manufacturing methods and the unique Bucyrus-Erie plant facilities, most complete of any in the industry.

The result is a "years ahead" machine built to highest standards of workmanship and performance—a machine that will give you big output with outstanding economy of operation. Remember the name that has been synonymous with fine excavating machinery afloat and on land for 67 years—Bucyrus-Erie!

SO. MILWAUKEE **BUCYRUS ERIE** WISCONSIN

19547C

What He Says about KINKING

One of the quickest ways to ruin a wire rope is to let it kink. That, says the Bethlehem engineer, is certain death for the rope. Even though your eye may detect no damage . . . it's been done. For kinking throws wires and strands out of harmonious balance; leads to spot wear and wire breakage long before the rope has lived its normal life.

Improper unreeling is a common cause of destructive kinking. Never lay the reel on its side without a turntable and attempt to lift off the rope. That's just asking for trouble. Instead, jack up the reel so that it revolves freely; then, while one man "brakes" the reel, another should slowly pull off the rope in a straight line.

Be careful, too, when handling a *coil* of rope—one not wound on a reel. Merely grabbing the rope and starting to pull will invariably produce damaging loops and kinks. To uncoil, place the end of the rope on the ground, then roll the coil like a hoop, in as straight a line as possible.

The Bethlehem field engineer will gladly give any helpful pointers on the proper way to unreel and uncoil wire rope. It's something *every* user of rope should know.

Remember, there's no charge for the services of the Bethlehem representative, no matter how much time he spends with you. It's his job to help you in selecting wire rope and getting the best service from it. Feel free to call him on any wire-rope problem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE . . . think BETHLEHEM

SMALL BUT PLENTY *TOUGH*

Here's a rugged little bulldozing team that can really turn out a tremendous amount of work on any job. The HD-5 and Baker Bulldozer is small and compact, easily maneuvered, easily transported, easily operated. It's fast on its tracks, but packs a powerful punch when the going gets tough.

Direct hydraulic lift on the blade means faster action, more accurate control, and positive down pressure — for easier penetration in tough digging.

Simplified tractor mounting maintains tractor balance — saves wear and tear on the tractor, converts full tractor power into push on the blade.

There's no better bulldozing team in the 40 HP class. Try one on your next job and see the difference — compare performance, costs, output and you'll be way ahead with Baker. See your Baker Allis-Chalmers dealer today for delivery schedules.

BAKER MFG. CO. SPRINGFIELD, ILL.

BAKER

BULLDOZERS • GRADE BUILDERS • SNOW-PLOWS

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Excavating Engineer

founded 1903

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Another Example of Efficient Power at Lower Cost

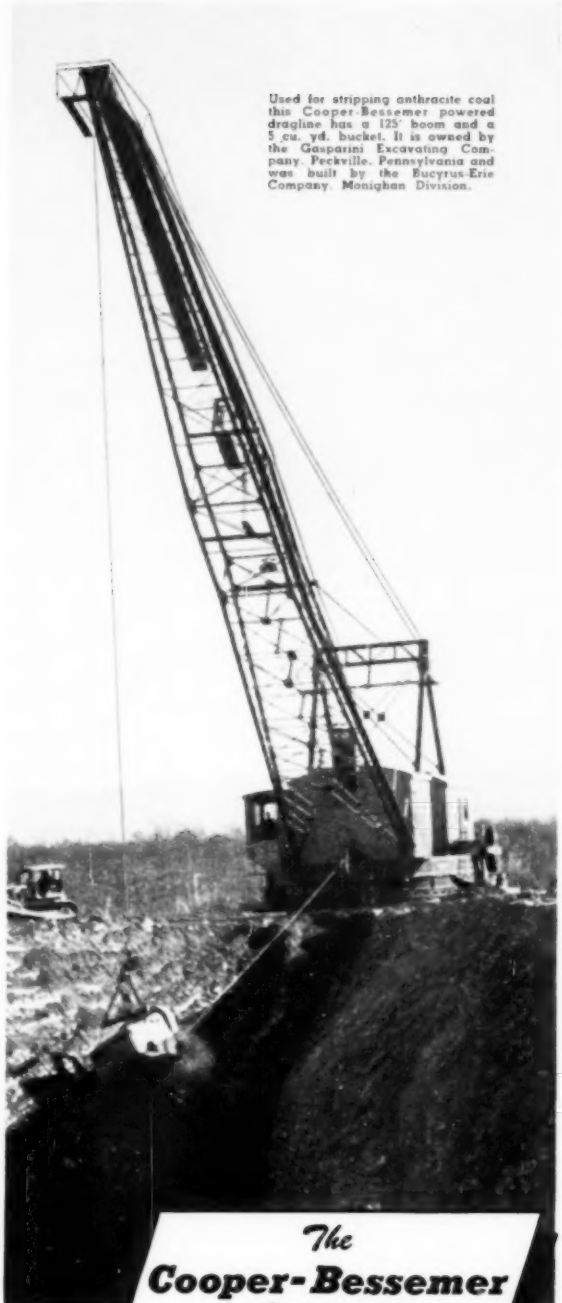
THEY DUG DEEP

. . . came up with facts on low-cost power

IN addition to digging up dirt and rock, draglines have done a fine job of uncovering both the advantages and shortcomings of power units. It's such punishing work that only exceptional engines can take it for long.

Cooper-Bessemer diesels are widely used for powering draglines, because they have qualities that are decided assets in this or any other kind of heavy-duty service. They're compact, run smoothly at any load, and hold up under those split-second jumps from no load to peak load. They offer all that's to be had in diesel stamina . . . and that represents a lot of trouble-free performance.

Maybe you're planning a heavy-duty power application. If it falls in the 100 to 3500 bhp range, stationary, marine, or otherwise, there's a Cooper-Bessemer diesel that will give you years of reliable power at the lowest of low cost.



Used for stripping anthracite coal this Cooper-Bessemer powered dragline has a 125' boom and a 5 cu. yd. bucket. It is owned by the Gasparini Excavating Company, Peckville, Pennsylvania and was built by the Bucyrus-Erie Company, Monighan Division.

The **Cooper-Bessemer** *Corporation*

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York City Washington, D. C. Bradford, Pa. Parkersburg, W. Va.
San Francisco, Calif. Houston, Dallas, Gregston, Pampa and Odessa, Texas
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Caracas, Venezuela Gloucester, Mass. Colmes Engineering Co., New Orleans, La.

MAKE IT A REAL ROCK SHOVEL

for the heart of YOUR JOB!

ROCK DIGGING is the real test of any shovel. If you have a real Rock Shovel for your *Key Spots* you won't have to worry about output anywhere.

Your Northwest is a real Rock Shovel. It's designed as a Rock Shovel and it has advantages for *rock digging* that no other shovel has.

The Northwest welded boom design is based on extensive scientific tests, combined with the results of performance in the field, not on theory. The Northwest Dual Independent Crowd utilizes force other independent crowd shovels waste. Result: — it handles harder digging and more yards per hour. The Cushion Clutch reduces shock overloads to all parts under power, increasing cable and machine life. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and the "Feather-Touch" Clutch Control takes the back-breaking effort out of operation.

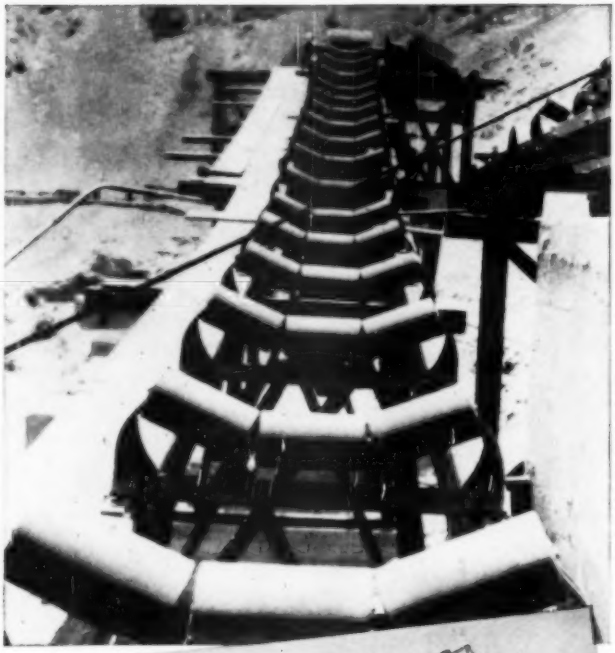
Plan now to have a Northwest in the *Key Spots*. Ask about these Northwest advantages. Find out why the Northwest is the Repeat Order Machine.

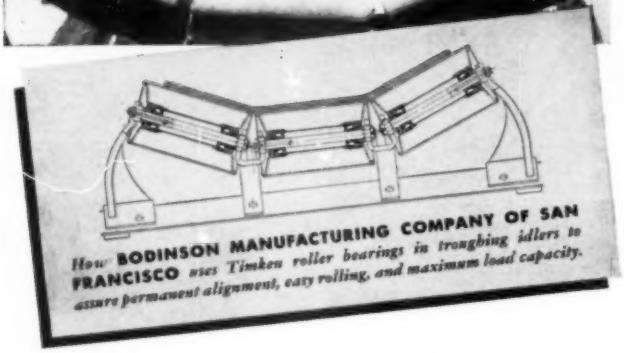
NORTHWEST ENGINEERING COMPANY
1506 Field Bldg., 135 South LaSalle St., Chicago 3, Ill.

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Less waste for your belt...with conveyor idlers on TIMKEN® bearings





How **BODINSON MANUFACTURING COMPANY OF SAN FRANCISCO** *uses Timken roller bearings in troughing idlers to assure permanent alignment, easy rolling, and maximum load capacity.*

ONE way to cut down on waste is to reduce belt wear to a minimum. Bodinson Manufacturing Company of San Francisco does just that by using Timken® bearings in its All-Steel Belt Conveyor Idlers. Timken bearings reduce friction and thus prevent drag on the belt. And they hold idlers in rigid alignment, eliminating excessive rubbing and scuffing.

With idlers mounted on Timken tapered roller bearings you also save on maintenance time and materials, get longer idler life, and avoid breakdowns.

Timken bearings are designed to provide maximum load capacity with minimum friction. The line of contact between the rolls and races gives shafts firm, rigid support. Made of Timken fine alloy steel, Timken bearings normally last the life of the idler.

As a result of their smooth surface finish and true rolling motion, they operate freely, frictionlessly, even under the heaviest loads. And they carry any combination of radial and thrust loads.

Timken bearings in your product add a valuable sales feature. They build greater acceptance for your product among customers because the long-time dependable performance of Timken bearings have made Timken-equipped products first choice throughout industry. When buying bearings, specify "Timken". When buying new equipment, be sure it's Timken-equipped. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This label on a product means its bearings are the best.

TIMKEN BEARING CAPACITY RATINGS INCREASED 25%.

Since Timken bearings were last re-rated some 19 years ago there has been such a further and constant improvement in quality that we are now able to announce a 25% increase in radial and thrust load carrying capacity. This may make possible the use of smaller bearings with savings in bearing cost, material cost and weight. Engineers will be able to utilize the advantages of Timken bearings in more applications than in the past.

A new Timken Engineering Journal, now in preparation, will give you complete capacity rating tabulations. For further assistance, write us today.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬭ AND THRUST ⬭ LOADS OR ANY COMBINATION

YOU'LL get more payload per pass and more passes per hour . . . step up production 10 to 50% . . . when you use a Page Automatic and use it correctly. Quick loading and immediate hoisting are the keys to big yardage. The closer the cycle of operation approaches that of a grab-bucket, the better the yardage will be. Page Automatics land in digging position, dig right in at the first pull on the loadline and get full payload within 1 to 2 bucket lengths, regardless of depth . . . 20 ft. to 100 ft. or more. With most of your operations under or near the boom end, minimum hoisting power is required.

The Page Automatic is the bucket that takes most of the "drag" out of your dragline . . . full loads in shorter distances save bucket and cable wear, reduce maintenance, minimize operator fatigue. Page Automatics are available in any size from ⅜ yd. to 30 yd. Each Automatic is guaranteed to out-dig any other dragline bucket of comparable size. For detailed information, see your construction equipment distributor, or write for Bulletin 1519.

PAGE ENGINEERING COMPANY
Clearing Post Office, Chicago 38, Illinois

PAGE *Automatic*

DRAGLINE BUCKETS *and* WALKING DRAGLINES

NOW IT'S A SNOWPLOW

Plenty of traction and power combined with greater maneuverability make it the ideal outfit for plowing snow from narrow roads, streets, alleys, parking lots, many other places.

NOW A SNOW LOADER

Quickly picks up and loads snow into trucks from wherever snow has to be removed — industrial plants, cemeteries, airports, institutions, streets, alleys, parking lots, gasoline stations.

For All Types of Jobs

Interchangeable Attachments Make The **ALLIS-CHALMERS HD-5*** and **TRACTO-SHOVEL** *A Versatile, Money-Saving, All Season Producer*

The ATTACHMENTS

- 1 Cu. Yd. Standard Bucket.
- ¾ Cu. Yd. Narrow Bucket.
- 2 Cu. Yd. Snow Loader Bucket.
- 1 Cu. Yd. Rock Bucket.
- Teeth For All Buckets.
- Heavy-duty Bulldozer Blades — narrow and wide.
- V-type Snowplow.

***HD-5 weighs 11,250 lbs. . . . provides 40.26 drawbar hp., 50.25 on belt**

NOW IT'S A SHOVEL

Digs basements, loads surplus material into trucks from roads and streets, loads from stockpiles — sand, gravel, crushed rock, etc. . . . for all kinds of excavating and fill work, numerous loading jobs and crane work.

NOW A BULLDOZER

Equipped with a heavy-duty blade, backed by ample traction and power, has the ability to excavate in tough going, backfill, handle all kinds of leveling work.

the Year 'Round

Here's an outfit that brings you an income throughout the year. No need to put it away in the winter and wait for spring. When the dirt and material handling season ends you simply take off the bucket or bulldozer and quickly attach a snowplow or snow bucket—depending on the job to be done.

In every community, large or small, and in the country, there are countless snow removal jobs just made to order for this outfit.

Get all the facts from your Allis-Chalmers dealer . . . start earning a year around income NOW!

Not Tied Down To Specialized Duty—Yet Gives Special Performance On Every Job

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

LOOK TO [redacted] FOR ADDED VALUES

THEY'RE

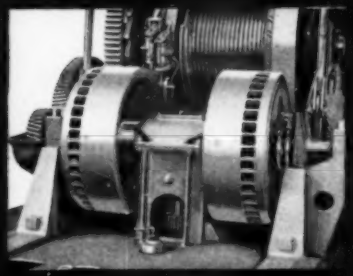
SWINGING

TO THE MAGNETORQUE!

Perhaps you've wondered why so many users are buying—and reordering—the P&H 1055. One reason for this mounting preference is the Magnetorque swing. Once you've owned a machine with it you won't be happy with anything else.

It's the greater smoothness—easier operation—greater speed—the freedom from upkeep and repairs—that will sell you the way they have sold so many other experienced users. These are extra benefits—*added values*—that make the P&H 1055 the fastest selling machine of its size and class.

If you'd like to inspect a 1055 at work, ask us to tell you where you can see the one nearest you.

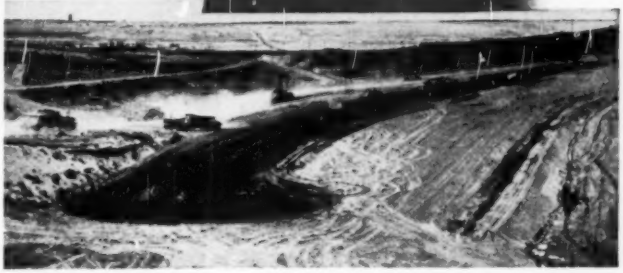


P&H EXCAVATORS

HARNISCHFEGER CORPORATION

TOUGH JOBS MOVE FASTER with GM DIESELS

Mammoth O'Sullivan Dam (formerly called Potholes Dam) took more than 9 million cu. yds. of earth and rock fill. Toughest hauls on this rugged project were assigned to 22 GM Diesel-powered Euclid bottom dumps in the fleet owned by contractors Lytle, Amis and Green. Six-mile round trips—with half the distance on an 8% grade—were completed in an average of 23 minutes, including loading time.



ALL OVER the country you see General Motors Series 71 2-cycle Diesels taking over the hard jobs and setting records for speedy completions.

In this case, on the 8% down-grade at O'Sullivan Dam, *braking capacity* of the engine was just as important to the contractors as "power at every downstroke." Full compression braking makes the GM Diesel powered "Eucs" easier on brakes and linings.

These 2-cycle Diesels also deliver high torque that gives trucks and tractors fast get-away and smooth up-grade pull even with a punishing load.

Add these advantages to their low fuel costs and their exceptional dependability, and you have some of the reasons contractors everywhere are saying, "We pick GM Diesels for our toughest assignments."

Before you specify power for any equipment, get all the facts. Call your local GM Diesel dealer, or write us direct.

DETROIT DIESEL ENGINE DIVISION

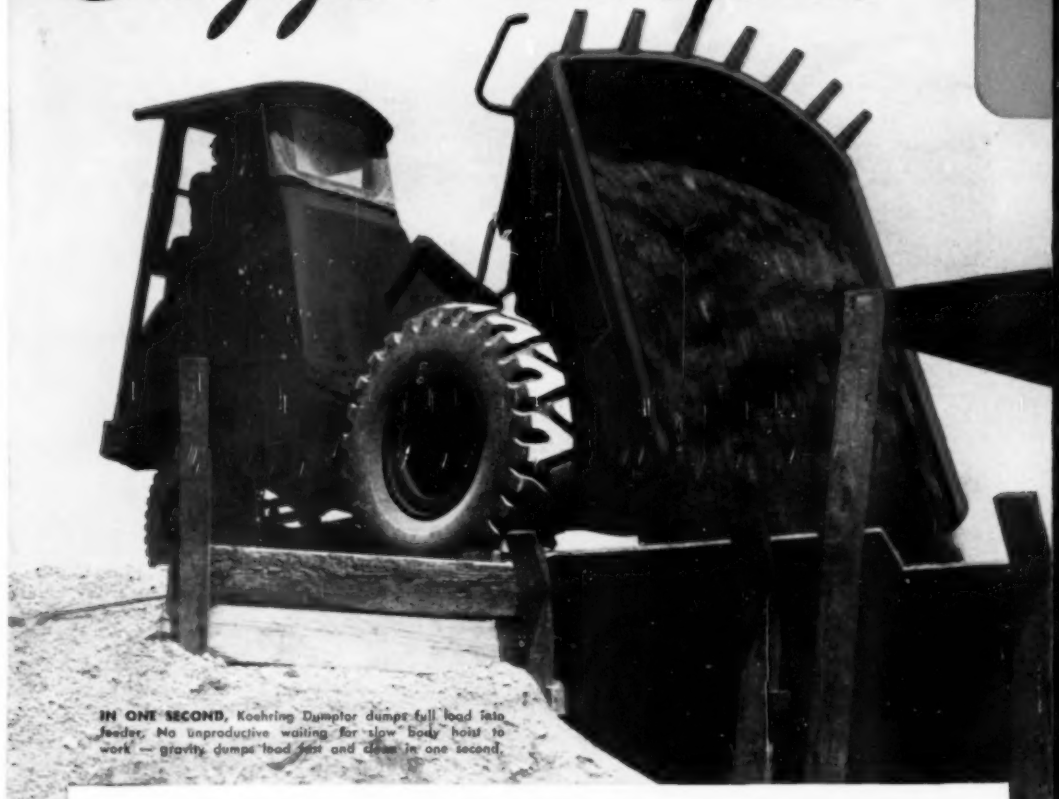
SINGLE ENGINES · Up to 200 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS · Up to 800 H.P.

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

FOR *Bigger Output*



IN ONE SECOND, Koehring Dumptor dumps full load into feeder. No unproductive waiting for slow body hoist to work — gravity dumps load fast and clean in one second.

STEEP GRADES — Ability to pull full loads up grades to 24% make Dumptors especially suitable for heavy hauling out of pits. Sturdy hydraulic brakes give complete control on steep down-hill runs. Parking brake is independent.

ROUGH HAUL ROADS don't slow up Dumptors. Ruts won't twist heavy-duty frame because steering axle oscillates as much as 21°, takes the strains out of rough mine road travel. Big tires help cushion shocks, give better traction, flotation.

KOEHRING HEAVY DUTY

in mines, pits and quarries
KOEHRING DUMPTORS
load FASTER • haul FASTER • dump FASTER

ON typical, rough, off-road hauls, you can increase trips per hour, yardage per day and reduce maintenance problems with Koehring heavy-duty, 6-yard Dumptors. Here's why:

Short Turning Radius, Big Target SAVE SPOT AND LOAD TIME

Short, 19'6" turning radius and compact design let Dumptor get close in under shovel . . . save jockeying back and forth. Big, 64 square-foot body opening provides an easy-to-hit target. Result — increased shovel production, more haul-time, less spot and load time.

Heavy-Duty 6-Yard Body BUILT FOR HEAVY ROCK SERVICE

To take severest shocks of shovel-loading, all-welded Dumptor bodies are heavily ribbed with 4" channels. Bottom of seasoned 1-⅝" oak timbers, between two 5/16" steel plates, cushions load shocks. In heavy mine and quarry service, Dumptors give you less down-time, more work-time, year in, year out with less maintenance care.

Ton of Strength per Ton of Payload SPEEDS TRAVEL ON ROUGH HAULS

Koehring Dumptors have rugged 8" ship channel main frame, heavily trussed . . . 4" chrome steel drive axles . . . cast alloy-steel "I" beam steering axle, that take the twists and strains of fast off-road travel. Big rugged tires take road shocks. There are no leaf springs . . . Dumptor needs only one big double-coil spring, on steering axle. You have NO spring maintenance.

6 HP for Every Ton of Gross Weight GIVES GREATER GRADE-ABILITY

Dumptor has 6 HP for every ton of gross vehicle weight. That means more "GO," more acceleration, less shifting on grades. Also, plenty of power to climb grades to 24% with full load. Dumptors are built to stand up under the toughest hauling of mine and quarry service.

No Slow, Troublesome Body Hoists . . . DUMPTOR DUMPS IN ONE SECOND

At the dump, gravity dumps load . . . *fast*. One second and body is empty . . . you're on the way for another load. You save 15 to 25 seconds every dump. No mechanical complications . . . no body hoist maintenance. Free-swinging kick-out pan breaks suction of sticky materials . . . adds 3/16" of steel to strength of Dumptor bottom.

No-Turn Shuttle Operation SAVES SLOW TURNS EVERY TRIP

Because Koehring constant-mesh transmission makes same 3 speeds available in both directions, Dumptors are never turned on shuttle hauls. On a 1,000' haul (16 round trips per hour), this gains 8 minutes every hour.
Let your Koehring distributor show you what Dumptors can do to save money in *your* mine, pit or quarry.

Koehring 605 Rock Shovel Keeps Pace with Fast Dumptor Hauling Speed . . .

For balanced, high-production teamwork on both your excavating and hauling operations, team up your Dumptors with the Koehring heavy-duty 605 Rock Shovel. Its fast operating speeds . . . big 1½-yard dipper capacity . . . rugged, extra strong boom, with shock-absorber mount . . . and big, power-operated clutches, all keep production high, costs low. Your Koehring distributor also can show you heavy-duty Koehring excavators in ½-yard, ¾-yard, 2½-yard sizes to satisfy your exact requirements.

KOEHRING COMPANY, Milwaukee 10, Wisconsin

Subsidiaries: JOHNSON • KWIK-MIX • PARSONS

DUMPTOR—Trademark Reg. U. S. Pat. Off. K824

"ROLLS WITH THE PUNCH"

of BUCYRUS ERIE Bullgraders-Bulldozers

The rolling action you see here is a result of two recognized features of Bucyrus-Erie Bullgraders and Bulldozers: (1) Perfect *balance* between B-E equipment and the tractor; (2) The scientifically curved B-E blade.

Whether you use cable or hydraulic control this is a one-two punch combination that really peels the dirt off in a smooth easy roll—gives you faster, cleaner earth-moving on the job. Watch a Bucyrus-Erie outfit on a hill or side slope and see how *balance* keeps it level — without nosing down. Watch it perform in sticky mud or loose sand.

Your International Industrial Tractor dealer can give you the full story on why more dirt "rolls with the punch" of a Bucyrus-Erie Bullgrader or Bulldozer.

BUCYRUS-ERIE CO., So. Milwaukee, Wis.

MORE REASONS WHY BUCYRUS-ERIE UNITS HIT HARD AND FAST

- **Blade mounting allows free track oscillation without changing blade angle.**
- **Bullgrader blade angled or tilted in few minutes by one man.**
- **Box girder frame plus flame hardened weldments give great strength.**
- **Proper sheave alignment for long cable life.**
- **Operator has clear vision in sitting position.**
- **New power control winch means easier operation.**
- **World-wide service through International dealers.**

127T49C

See Your INTERNATIONAL Industrial Tractor Distributor

Excavating Engineer Starts 45th Year

TO INAUGURATE 1949—its 45th anniversary of service to excavating and allied fields—EXCAVATING ENGINEER takes on a "new look" both inside and out. The cover design has been chosen to achieve a simple, eye-catching appearance. Besides being "easy on the eyes," new type will allow EXCAVATING ENGINEER to present more information more attractively.

Way back in December, 1904, EXCAVATING ENGINEER got its start as Steam Shovel News, a quarterly published in Toledo, Ohio. The name was changed to "The Excavating Engineer" in 1912. The creators of the pioneer publication intended ". . . to issue quarterly an interesting symposium of news, conditions and facts relating to excavating, excavating machinery and those who are engaged either in contracting or in any way connected with this work." Today, we would probably phrase it differently, but essentially this same purpose is still uppermost in the minds of the editors of EXCAVATING ENGINEER.

From a 16-page book with a circulation of about 1000, the magazine has grown to an average 64 pages read each month by more than 25,000 excavating, drilling, blasting, and hauling specialists all over the world. With the ever-growing interest of readers in its pages, EXCAVATING ENGINEER will strive to increase its service to the industry in coming years—service built on the foundation laid down by its first editor and publisher.

YEAR 'ROUND UVALDE

• Above: A Mack EQX truck with 10-yd. Easton side-dump trailer travels from Uvalde asphalt pit to primary crushing unit. In center background, a Bucyrus-Erie 38-B clamshell rehandles stockpiles. At right is cover stone and continuous mixing plant.

Uvalde Rock Asphalt Company, San Antonio, Texas — one of the largest producers of natural limestone rock asphalt — has revamped its Blewett (Texas) quarry to provide continuous 12-month operation. Modern equipment and new efficient stockpiling methods more than double capacity with a relatively small crew.

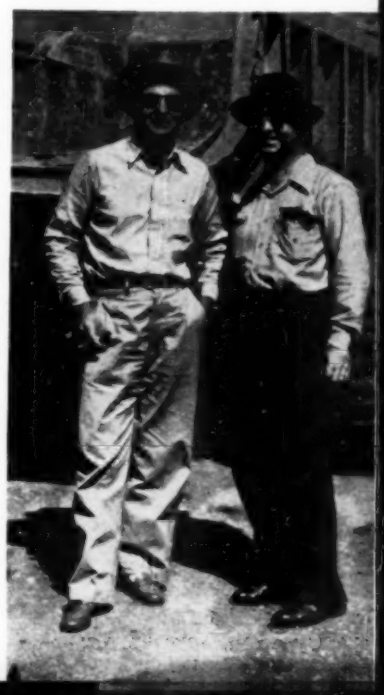
SUBSTANTIAL improvement of all phases of their operations has increased production capacity of Uvalde Rock Asphalt's Blewett, Tex., mine from 425,000 to 1,000,000 tons of processed rock asphalt a year. Improvements include use of larger blast holes, faster hauling, electric hoist dumping. Stockpile facilities are greatly enlarged to allow quarry operation at a steady rate despite large fluctuation in demand. Physical mixing of material in stock piles to meet special requirements is now possible and reclamation generally speeded up.

Material Originally Imported

In several parts of this country are found deposits of rock impregnated with natural bitumen. Crushed, the particles have a strong affinity for each other and when laid as a light road coating, the product makes a superior road surface. The first rock asphalt to be laid in the United States was imported from Europe in 1872 and used on the streets of New Orleans. It gave satisfactory service, but the high cost discouraged further use. Similar material was imported in small quantities from Germany, Switzerland, Italy and France.

But it was not until deposits were discovered in this country that the natural product came into appreciable use—a material found to be superior to that mined anywhere else in the world.

The Uvalde product is a finely porous limestone composition—95 to 99% pure calcium carbonate—impregnated with native asphalt. This asphalt is a peculiarly hard and pure bitumen which is highly resistant to acids, alkalis, moisture, sunlight, and other



• Quarry superintendent D. L. Timberlake (left) talks to visitor on the job, E. B. Chambers of Bucyrus-Erie Co.

destructive elements. The bitumen content of Uvalde rock asphalt, as it occurs in nature, varies from two to 12% by weight.

Used in Various Mixtures

This material occurs in the Anacacho formation of the Upper Cretaceous, and in horizontal strata from 20 to 80 feet in thickness under from one to 20 feet of overburden—an average of 10 feet. It is quarried and delivered to the plant for the manufacture of various paving mixtures or aggregates; specifically, Duraco, Flexmix, and Urastone. Duraco is the trade-mark name used by the Uvalde company for its patented pavement mixture consisting of limestone rock asphalt, flux oil, and coarse aggregate.

Duraco is furnished in two sizes, ⅝ and ½-in. maximum size. It is made with natural limestone rock asphalt consisting of from seven to 10 per cent asphalt and 90 to 93% limestone. Flexmix, produced in four sizes, is 94% Uvalde rock asphalt, 3% flux oil and 3% water.

Urastone is the name of the limestone rock asphalt aggregate used in surface treatment and is available in all sizes. The addition of flux oil—a thick viscous non-volatile oil recovered from petroleum distillation—is necessary to soften the natural product for highway application.

The FOB mines price of the Uvalde product is said to be the lowest of any comparable product in the world and this natural road topping competes directly with the artificial product throughout the marketing area of the states of Texas and Louisiana. Freight rates make competition difficult in more remote areas.

Deposits Opened in 1897

The deposits at Blewett (100 miles west of San Antonio) were originally opened up in 1897 by a New York firm to extract asphalt (in competition with Trinidad Lake asphalt) for use in paint and other products. The firm operated for several years until petroleum asphalt brought prices too low to permit the expensive extraction process to continue. The company then started marketing the natural product for road surfacing but sales were insufficient and the quarry was abandoned in 1903.

The property was purchased in 1911 by J. B. Smyth of Beaumont, Tex., and a new company, Uvalde Rock Asphalt, started production in 1912. Mr. Smyth served as president of the organization until his death in 1938.

Early operations bore little relation to today's high degree of mechanization. Material was drilled by jackhammers in 1¾-in. by 20-ft. holes, shot and loaded by hand to railway haulage. Shovels—2-yd. Bucyrus 70-C railroad type—were first used in 1918. Wagon drills were purchased in 1930 for 2¾-in. x 30-ft. holes and blast holes increased in diameter to 6-in. x 70-ft. in 1942 when the first Bucyrus-Erie 22-T churn-type drill was brought to the mine. Railway equipment gave way to truck haulage in 1938.

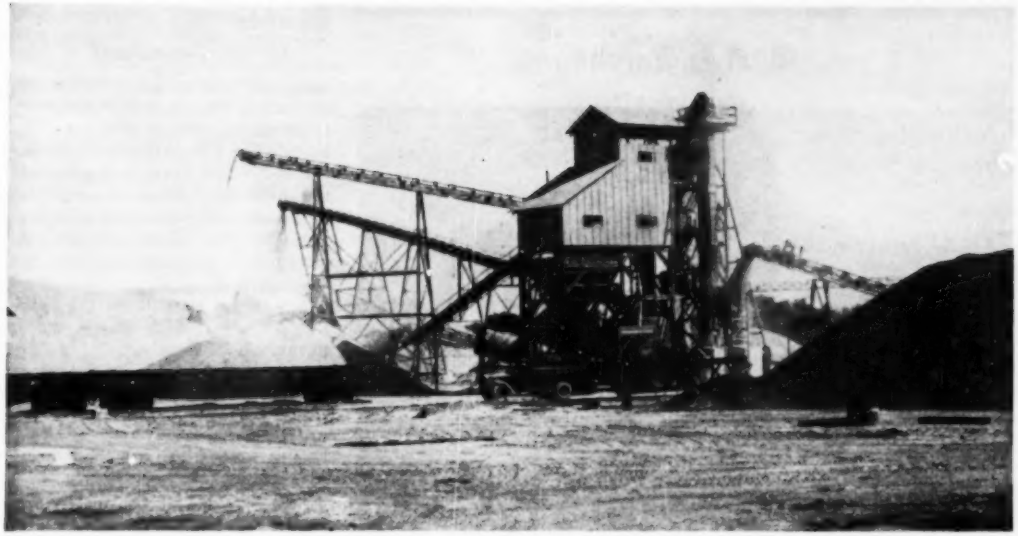
Up until the advent of churn type drills in 1942, drilling and blasting in the quarry were conducted on the theory that many blast holes small in diameter were required in order to obtain satisfactory breakage. Two or three wagon-drill crews were required to prepare a maximum of 1000 tons of ore a day.

Subsequent work with larger diameter blast holes has demonstrated

• A 15,000-lb. blast brings down an avalanche of rock for loading by the shovels. Photo above shows broken rock immediately after blast. Drills are Bucyrus-Erie churn-type at left, and Ingersoll-Rand drifter at right. Major blasting is done every 30 days.

• Above: This view shows wide face of pit where 1½-yd. Bucyrus-Erie 38-B shovel (left) and Lorain 820 shovel (center) are loading rock to Easton trailers pulled by International and Mack trucks. At right, Bucyrus-Erie 29-T blast hole drill puts down 10-in. holes in rock asphalt.

• Below: Easton side-dump trailer at right is dumped by electric hoist into primary crushing unit. Rock is taken by conveyor belt to main screening and secondary crushing unit, behind which is a large storage bin. Plant in center is re-wash, cover stone and cover mix plant.



● Three belt conveyors discharge into storage piles at cover stone and continuous mixing plant, the fourth plant at Uvalde. Feeders under stockpiles allow fast reclaiming in direct loading to railroad cars and trucks, and further processing and mixing.

superior control of breakage in addition to a considerable decrease in cost. Institution of 6-in. holes put down by a Bucyrus-Erie 22-T drill in a 16 x 20-ft. pattern cut drilling costs to one-quarter of those experienced with wagon drills. This year, a Bucyrus-Erie 29-T drilling 10-in. blast holes has again cut costs—this time in half. The 29-T drills 600 tons of rock asphalt an hour—and blasting is more efficient than ever before.

Uvalde officials attribute this significant reduction in drilling costs to the fact that the 29-T with its heavy string of tools puts down 10-in. holes at practically the same drilling speed as smaller units drilling smaller-diameter holes. Since a wider spacing is now possible, less drill footage is required with fewer holes, less moves, and fewer set-ups. The same amount of powder is used per ton of material blasted, but because it is better distributed in the large holes, a more uniform fragmentation is obtained with less oversize and less secondary blasting.

The deposit dips both east and north and the rock asphalt lies in an 80 to 85-ft. layer above shale and hard limestone. The upper 65 feet of rock asphalt is "lean" rock containing 4 to 6% bitumen. The bottom 15 feet is "rich" (6 to 11%). Overburden is porous limestone averaging 10 feet in depth. The pit has a 700-ft. wide face limited on the east by increasing overburden (up to 30 feet deep) and on the west by a thinning out of the rock asphalt.

An Ingersoll-Rand X-71 wagon drill with 1¾-in. Ingersoll-Rand bits is used to sink holes in overburden on an 8 x 8-ft. pattern. No. 3 Atlas 1½-in. x 8-lb. cartridges are used in a 4 to 1 ratio.

Drill Face in 10 Days

Blast holes are drilled in rock asphalt 28 feet in from the edge of the long face and 35 feet apart. Holes go down 10 to 11 feet per hour, four feet below the bottom—usually a total of 84 feet. The 29-T drill works 9-hr. shifts, five days a week, can drill a row of holes the entire length of the face in 10 days with one crew—which is then available for the balance of each month to do utility drilling with the smaller 22-T.

Bits average 800 to 1000 feet of 10-in. hole between hand sharpenings. Bits are carried on a 5½-in. x 28-ft. stem suspended by a ¾-in. hemp center left lay American Steel & Wire rope.

Major blasting is done every 30 days. One shot consists of 14 holes each continuous-loaded with 9-in. x 50-lb., 55% gel Atlas Apex No. 3 cartridges to 20 to 28 feet from the top of the face. Powder from the first five sticks is dumped to give a good load in the bottom of the hole. Electric firing is used with Rockmaster caps and Primacord to the bottom of each hole. Powder ratio is about one pound to 2½ tons.

As a result of superior breakage achieved with larger blast holes, secondary drilling has been reduced to a minimum. At the present time six men are employed on one shift using Ingersoll-Rand JB-4 Jackhamers and 1½-in. bits. Since major blasts occur only once a month, the same powder man handles secondary blasts (during noon shutdowns each day).

Improved Hauling Setup

Blasted rock asphalt is loaded by two 1½-yd. shovels—a Lorain 80 and a Bucyrus-Erie 38-B. Hauling units—two to each shovel—are International KR-11's and Mack EQX's pulling 10-yd. Easton side-dump trailers. Trailers are dumped by an electric hoist at the crusher. These units, which recently replaced 5-yd. end dumps, have enabled the shovels to increase their production 30% through greater capacity and faster spotting.

Uvalde officials found that end dumps were using as much gasoline to dump at the crusher as they used on the short hauls (these average 900 feet on a 4% grade). Five of these rigs, with their 1½-minute dumping

Continued on page 20

Myrl L. Jacobs

Vice-president, Raw Materials Properties division of the Bethlehem Steel Co. since 1940, Myrl L. Jacobs, 63, passed away on the morning of Nov. 13, at the Pan-American guest house in Trinidad, British West Indies. He became ill the night before at Bethlehem's Palua mine and was flown to the Piarco airport.

Mr. Jacobs had been with Bethlehem Steel for 28 years — since 1920 when he became general manager of quarries. In 1934 he became general manager in the stone and slag division, being advanced to assistant to the vice-president in 1939. During 1940, the same year in which he became vice-president, he was also elected president of various Bethlehem subsidiary companies engaged in mining and a director of Bethlehem Steel Corp.

Born at Weldbank, Pa., May 16, 1885, Mr. Jacobs attended Marietta College and Mercersburg Academy. He received his degree in mining engineering from Lehigh University in 1910, beginning his business career that year as assistant engineer for Astoria Light, Heat and Power Co.

In 1912 he joined the Mexican Light and Power Co. as assistant engineer in charge of hydro-electric tunnels and dams, remaining until 1913 when he accepted a position as assistant engineer with the New York Municipal Railways in Brooklyn, N. Y. From 1916 until he joined Bethlehem, Mr. Jacobs was an engineer with F. G. Clement and Company at Bethlehem, Pa.

• Texas and New Orleans Railroad pile driver works on spur which was recently constructed to extend Southern Pacific service to the Uvalde Rock Asphalt plant.

Uvalde

Continued from page 19

time, were able to supply the crusher demand of 325 tons per hour only by resorting to double dumping. The Eastons are dumped in 30 to 40 seconds. No backing in is required and the dump beam takes all weight off the truck during the dumping operation. The two shovels can now load more rock to the trucks than the plant can handle.

A row of blast holes the entire length of the face is blasted once a month. The shovels travel parallel to the face taking four to five passes along its length to clean up the blast. Shovel swings are kept short—seldom more than 110 degrees—for utmost loading efficiency. A Cat-mounted La Plante-Choate hydraulic dozer smooths the pit floor and spreads surplus fines from the plant on haul roads to keep them in best possible condition. The pit is kept dry by three 6-in. American Marsh pumps with D-4400 Caterpillar engines.

Primary Crusher in Quarry

In order to produce a large number of specific sizes of material, Uvalde maintains an elaborate processing plant. To keep hauls to a minimum, the primary crusher—an Allis-Chalmers 21-K powered by a 250-hp electric motor—is located in the pit. Crushed material (minus 5½-in.) is transferred by a No. 5 Jeffrey vibrating feeder to a 36-in. Goodyear belt conveyor, 465 feet long, which takes the material up to the secondary crushing and screening plant located 127 feet above the floor of the pit.

Here material is screened and crushed to a large number of sizes and conveyed to various stockpiles. Feeders located under all stock piles allow fast reclaiming either for direct loading to railroad cars or trucks or for further processing and mixing. Since the bitumen content of as-mined material varies from day to day, physical mixing in stock piles has been provided through multiple feeders.

The company can now produce a million tons of finished material annually and ship as many as 100 railroad carloads a day in periods of peak demand. Arrangement of storage, conveying and processing equipment is such that the plant has high flexibility. The high degree of mechanization has made possible a relatively

small crew—about 120 men—who are assured steady 12-months-a-year work.

The company powerhouse contains two diesel generators—a 5-cylinder JS-5 Cooper-Bessemer direct coupled with a 400-kva General-Electric alternator, and a 4-cycle type Y 240-hp Fairbanks-Morse coupled to a 300-kva G E. alternator. Balance of the electric power required at the mine is supplied by the Central Power and Light Co. of Texas.

The plant is served by two railroads: a spur line joins the Southern-Pacific main line at Cline, Tex., six miles northwest of the quarry; and the Missouri-Pacific is also connected by a spur. Uvalde operates two switchers—44-ton 300-hp and 65-ton 400-hp General Electric diesel-electrics—on five miles of track.

Texaco industrial oils are used exclusively. All gasoline is supplied by the Sinclair Oil Co., and diesel fuel by Humble Oil and Refining Co.

Operate Own School

Uvalde operates its own commissary and school. This is an independent free school district that has about 65 students from first to eighth grades. The Uvalde school district operates a bus that transports about 65 students back and forth to the high school at Uvalde. A hotel is company operated, and 35 houses for workers' families are company owned.

Main offices of Uvalde Rock Asphalt Co. are in San Antonio and its Azrock Asphalt Tile Division is located in Houston. Officers include Glenn H. Alvey, president, and Vice-Presidents H. R. Brown and Joe E. Carroll, Jr. At the quarry in Blewett, P. E. Cain is manager, and D. L. Timberlake is superintendent.

Frank Harrison Cothran

Frank Harrison Cothran, 70, president of the Piedmont and Northern and Durham and Southern Railways at Charlotte, N. C., since April, 1937, passed away at the Charlotte hospital, September 1. A stroke had left him critically ill since last July.

Well-known both nationally and internationally as an engineer, builder and executive, Mr. Cothran began his extensive career in 1899 with the Seaboard Air Line Railway and subsequently held engineering positions with a number of railroads in the Southeast. Among his more notable achievements were the location of a considerable part of the Carolina, Clinchfield and Ohio Railroad, and the Piedmont and Northern Railway.

Following service as resident engineer in charge of construction of the Bridgewater development on Catawba River in the western North Carolina mountains, Mr. Cothran became division engineer for the Southern Power Co., now Duke Power Co. Among his other achievements were the direction of the Isle Maligne hydro-electric plant construction on the Saguenay River in northern Quebec, and the Beauhornois development, a large power plant and one of the links on the St. Lawrence River Seaway.

Consulting engineer for contractor organizations, various corporations, and for the Federal government, he also served as vice-president and general manager of the Quebec Development Co., the Duke-Price Power Co., and the Alma and Jonquiere Railway, all in Quebec. For a time Mr. Cothran was vice-president, general manager and chief engineer of the Beauhornois Construction Co. of Canada and construction engineer for the Beauhornois Light, Heat and Power Co. He earned membership in the American Institute of Consulting Engineers, the ASCE, the American Railway Engineering Association, Society of American Military Engineers, Institute of Engineers of Canada, and Corporation of Professional Engineers of Quebec.

His immediate survivors are his widow, Blanche, three sons, Frank Jr., and James of Charlotte, and Samuel of Charleston.

F. L. Jaeger

F. L. Jaeger, 69, vice-president of the Marquette Cement Manufacturing Co. when he retired on Mar. 1, 1944, died at his home in Chicago, Nov. 14. Widely known as "Val" to men in the industry, Mr. Jaeger spent 25 years with Marquette, during which time he made many friends among his business associates.

Born in Louisville, Ky., on Mar. 21, 1879, Val came to Chicago while still a small child. After his education in Chicago schools he worked on the open board of the Chicago Board of Trade, leaving there in 1911 to become a salesman for the Universal Cement Co. In Jan., 1919, he joined Marquette, becoming a territory salesman in Feb. 1919.

After being given the post of Southern sales manager, he opened the Marquette Memphis office. In 1933 Mr. Jaeger became general sales manager in the Chicago office which post he held when he was made vice-president.

Outside of business hours he enjoyed two principal hobbies, antiques and Oriental rugs. He was made a Kentucky Colonel by Governor Ruby Laffoon, and received a grand prize for selecting the best two-year old race horse for 1934 at Lexington, Ky.

Mr. Jaeger is survived by his widow, Frieda, a brother and sister, Chicago.

Grader—Dozer—Scraper

• Only the operator should be on the seat while the machine is in use. His efficiency is affected when operating space is crowded.

A guide to sensible measures for protection of operators of road patrols, bulldozers and scrapers, as well as other workers on the job and members of the public at large. These precautions can perform another important service for management—minimizing damage to equipment.

by Robert L. Moore

Senior Engineer, Construction Section National Safety Council

BEFORE setting up safety rules for any job, management should look into the hazards peculiar to that job. There are usually nine primary sources of injury attendant with the operation of road equipment:

1. Repairing and servicing equipment in dangerous positions.
2. Striking persons or vehicles with the equipment or with the blade of a scraper or bulldozer.
3. Unexpected violent tipping of equipment.
4. Unexpected violent jars or shocks to the machinery.
5. Uncontrolled traffic involving other vehicles.
6. Sudden movement of hauling unit while it is being connected to earthmoving equipment.
7. Hazards from limbs of trees or overhead obstructions.
8. Leaving equipment in dangerous positions unattended.
9. Failure of lifting mechanisms.

Basic Precautions

Best insurance for safe operation of earthmoving equipment is securing able operators and giving them thorough training before allowing them to start work. Only active-bodied men should be assigned as operators. They should be clearly instructed in the hazards connected with their work and shown safe methods of operation.

General and specific precautions applying to the various types of earthmoving equipment should be agreed upon by members of management and given to workmen as operating rules. Management should specifically delegate the responsibility for training operators in the safe use of their equipment.

Only second in importance is maintenance of equipment in good working order. Motors, chassis, blades, bladeholders, tracks, drives, hydraulic mechanisms, transmissions and vital parts should be rigidly inspected each day. Wheel bolts and bolts which hold engines to chassis also should be checked daily for tightness.

For adequate protection of operators, substantial seats or platforms should be provided on all equipment. Rail guards should be installed where possible to prevent the operator from being thrown off if the machine should tilt suddenly.

When work is done at night, adequate lighting should be provided by headlights, general job lighting or both. Access roads and haul roads with a tendency to become dusty should be sprinkled or watered regularly to improve visibility.

Suggested Operating Instructions

Before starting to operate his machine, the runner should be familiar with the contents of the equipment manufacturer's instruction manual and he should know exactly what he is to do with his equipment. Operating speeds should be consistent with the particular job and extra caution exercised when roads are wet or icy.

With some equipment, sudden dropping of one wheel results in violent tilting which may injure the driver by throwing him off the machine or against levers or wheels. In all cases, machinery should be driven off road shoulders at slow speeds. Because vibration may put the vehicle in motion, it should be a cardinal rule that an operator should never leave his machine

• Operator should know where material goes when working over the edge of a cut or fill.

Safety

on an inclined surface with motor idling.

To aid in protection of person or other equipment from projecting bulldozer or road patrol blades, blade ends should bear red cloth flags or markers. If possible, equipment should be driven entirely off the road at night. If this is not possible, any portion of a unit that projects into the road should be adequately marked with red lights or flares—red flags in daytime.

When equipment is in use on a section or road, it is always good practice to place barrier signs at sufficient distances from both ends of the operation to warn traffic of danger ahead. Primary warning signs, such as "Road Under Construction" or "Barricade Ahead" should be placed 600 to 800 feet from the point of operation.

Where operations are extensive, it is generally advisable to detour all traffic by way of another road, around the work site. If traffic must be maintained, flagmen should be stationed so that they are visible to oncoming traffic for at least 500 feet.

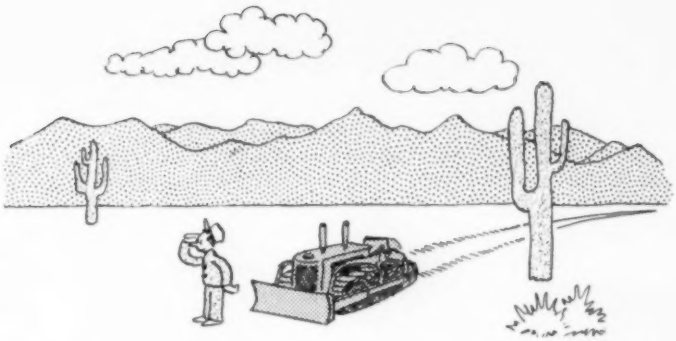
Station Flagmen

Road equipment should never be stopped or turned on a curve or hill unless the operator can clearly see approaching traffic for a distance of at least 1000 feet. Flagmen should be stationed on the road at both ends of the turning operation to warn approaching traffic.

When machines operate in close quarters, adjacent to excavations, buildings, other equipment, or near many workmen, a signalman should be provided. Employees should be warned never to jump on or off moving equipment, nor should employees attempt to direct traffic while they are operating equipment.

No one should be allowed to stand or sit in front or in back of a parked machine, because it might be started unexpectedly. Where low limbs of trees or other overhead obstructions present a hazard, operators should be specifically cautioned about them.

Before repairs are made on earthmoving equipment, the operator should make certain that the motor is not running—particularly when the clutch on a tractor is to be adjusted. Idling motors may cause enough vibration to throw in clutches or release safety pawls. Motors of all equipment should be stopped before refueling.



• Before moving a bulldozer, the operator should make sure no one is in the "danger area."

No one should stand in front of a tire which is carrying a heavy load or being inflated, because the locking ring might blow off. When wheels are removed for tire repair, the tire should be inflated with the locking ring next to the ground or with the wheel in a tire safety rack. When inflating a tire mounted on a piece of equipment, it is advisable to first place chains around the tire and rim at top and bottom.

Operators should be instructed to keep deck plates or steps of equipment free of grease, oil, ice or mud. Because a slipping hazard is always present, hobnailed shoes should be prohibited and corded soles recommended. Loose clothing which can get caught in moving parts of equipment should also be prohibited.

To prevent hand injuries, operators and helpers should use heavy gloves when handling cable. Hands should be kept clear of cable sheaves and other working parts.

Goggles are indicated where low-hanging branches of trees or shrubs can strike operators. They should also be used when sand or gravel is being worked. Hard hats should be worn by all operators when there is any danger from falling material or overhead hazards.

Whenever possible, motor graders should keep to the right side of the roadway. In urgent cases where blading against traffic is necessary, extra precautions (flags and barricades) should be used to warn traffic. When a grader is operated in hilly or rolling country, a red cloth flag should be displayed on a staff which projects at least six feet above the left rear wheel.

Bulldozers and Tractors

Before he leaves his bulldozer at the end of the work shift, the operator should put the machine where it is inaccessible to children and others—on level ground, if possible. Brakes should be set, the blade landed, and the gear shift lever left in neutral.

Operators should not allow other persons to get on or off bulldozers or tractors. Specifically, no one should be allowed to step on tracks or other parts of moving tractors. The blade should be kept close to the ground for balance when a bulldozer is travelling up a steep grade.

When a dozer is to be ridden down

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• Adequate lighting should be provided for night work.

• U-shaped device being used to drop post into hole and pour spacers holding posts in position were devised on job by contractor.

Streamlined Postsetting At South Coulee Dam

Ordinary materials went into the making of three special devices developed on the job by Sparling Steel Co. of Seattle and Spokane to meet their particular problems of setting guardrails along relocated U. S. Highway 2.

By W. O. Watson
Chief Earthwork Inspector
South Coulee Dam

AN OLD Civil War cannon barrel went to work recently atop South Coulee Dam, part of the Bureau of Reclamation's Columbia Basin Project, near Coulee City, Wash.

When Sparling Steel Co. of Seattle and Spokane began the erection of concrete post-supported, beam-type guardrails on both sides of the roadway on the relocated U. S. Highway 2 on the crest of the dam, they discovered that no Spokane contractor owned a device for punching postholes in earth and gravel, like that on the upstream side of the roadway. Don Sparling, a member of the firm, and his superintendents, decided to build one of their own. They agreed on a free-falling, winch-operated punch with a tapered section.

The main body of the punch was built from an old Civil War cannon barrel by welding a stellite-tipped steel cone to the muzzle, and a steel cap with a swivel ring to the breech end. The total weight of the punch is 2,000 pounds, exclusive of the square cage of welded steel angles in which the punch falls freely. To facilitate operating over the crowned surface of the roadway, the cage rests on ski-like runners made from steel channels.

The punch can be operated either from a truck with an A-frame or from a mobile crane, connections quickly made to either. Sparling found that this punch could put down a 3-ft. hole, 12 to 16 inches in diameter in fine-grained compacted soils in from four to 12 minutes, depending on the hardness of the soil.

Sparling developed two other applications of ordinary materials in meeting his specific problems in setting the posts. Because Sparling wanted to use small crews in building the guardrail, it was necessary to prevent dis-

placement of the posts during backfilling operations so work could be scheduled at the contractor's convenience. Usually, posts are not set up much in advance of the railing.

Spacers of two 1-in. black pipe were built with pipe spreaders welded to them at the ends and center. Bolt holes were located in short sections of ½-in. x 2-in. plate which were welded on the inside at the longitudinal ends of the pipe. Connecting pins which fitted into the posts were made of ⅝-in. rod, T-shaped to facilitate removal. Two spacers were used to achieve the desired rigidity. The posts were placed on 12½-ft. centers.

A lifting device for rapid handling of the 400-lb. concrete posts was also developed. It consists of an inverted U-shaped member with slots burned in the legs to form hooks which engage the T-shaped connecting pins. The hook on the winch line fits in a hole burned in a small piece of plate welded to the bottom of the U.

This equipment, designed by Norman Klein, Spokane superintendent, and W. R. Keizer, job superintendent for Sparling Steel, was used for the first time on this job.

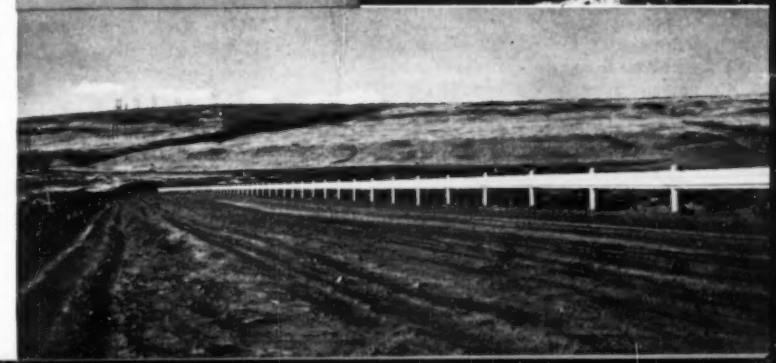
The punch was developed for use in the earth and gravel fill only. It was not used in the coarse rockfill on the downstream side of the roadway. Spacers and post-lifting device were applicable on the entire job.

• **Above, left: Close-up shows free-falling punch, winch-operated from A-frame of truck. Square, welded-steel cage rests on ski-like runners. Device was developed for earth and gravel fill. At left is W. T. Mulkey, assistant resident engineer, South Coulee Dam, and W. R. Keizer, job superintendent for Sparling Steel.**

• **Above, right: Surveyor aligns post as workers adjust it in hole. U-shaped lifting device on A-frame of truck has slots burned in legs to hold ⅝-in. rod, T-shaped connecting pins which were drawn through holes near top of post to hold ends of pipe spacers, thus maintaining rigidity of posts until guardrail could be set.**

• **Right: Workers tamp soil around post as it is adjusted in hole. A-frame of truck can also be used to support winch-operated punch which put down holes.**

• **Below: Finished guardrail with 9,500 feet of rail stands in compacted embankment on upstream side of roadway atop dam.**



Operation Warragamba

• Slace pumping began at the overshot weir on May 12, 1940, 46,336 mg have been drawn off the Warragamba River and delivered to Prospect Reservoir 16 miles away.

Scheduled to be the highest dam in the southern hemisphere when completed, Warragamba Dam, on Warragamba River 40 miles from Sydney, Australia, will form a reservoir with a holding capacity of 460,000 million gallons, enabling the surrounding area to meet all drought emergencies.

STILL in its preliminary stages of construction, Warragamba Dam, on Warragamba River about 40 miles from Sydney, Australia, will be the highest dam in the southern hemisphere when completed. Requiring from eight to ten years to build, the dam will be a straight gravity mass concrete wall, about 1,300 feet long and 400 feet above river bed level, tapered from a base 330 feet thick. The estimated cost of the dam and its appurtenant works is £9,000,000 ($36,000,000). This estimate does not include the cost of the pipelines for the outlet mains, cost of which is set at £3,500,000 ($14,000,000).

Five dams with a storage capacity of 122,183 mg now supply Sydney and the South Coast. Warragamba Dam will form a reservoir with a holding capacity of 460,000 mg, enabling Sydney to meet all drought emergencies. Because of the absence of perennial streams from which to draw, a water supply must be built up during rain periods. The catchment area of the Warragamba River is 3,383 square miles, the outstanding reason for its importance as a potential water supply.

The original dam site was selected 1¼ miles upstream at the junction of the Warragamba and Nepean Rivers, just above Megarrity's Creek which at the time seemed suitable as a spillway. In 1936, during an unusually dry period, an overshot weir, just above the site selected for the main dam was erected. It is 50 feet high, has a pumping station and pipeline, delivering 40 mgd to Prospect Reservoir, about 16 miles away across the Nepean River. The weir was completed in 1940.

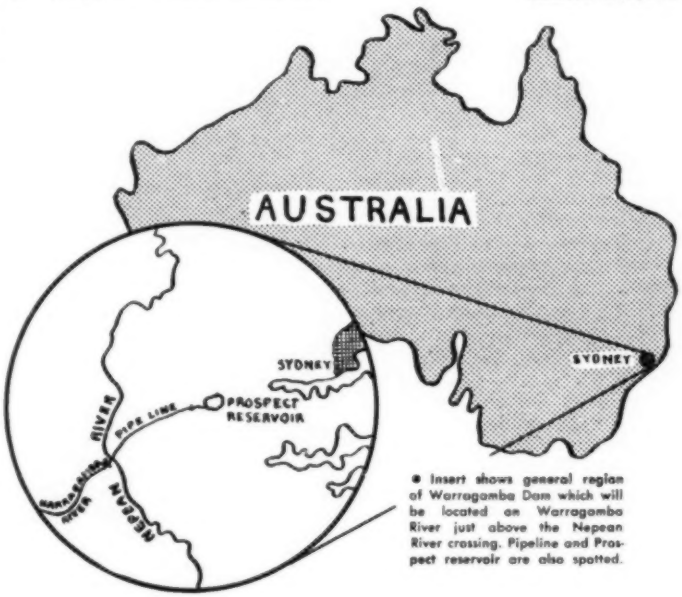
A balance reservoir (capacity, 8 mg) was constructed to regulate pressure and ultimately to provide for local water supply. After the water leaves the pumps it is dosed immediately with quantities of liquid chlorine. It arrives at Prospect completely sterilized and the small residue of chlorine dissipates in the reservoir.

• Arrow A shows the site of the present 50-ft. diversion weir on Warragamba River. Arrow B points to the site for the main dam.

Pipelines Begin in 1942

Work on the pipelines into which the main dam will feed was begun in Jan., 1942. Plans for three 84-in.

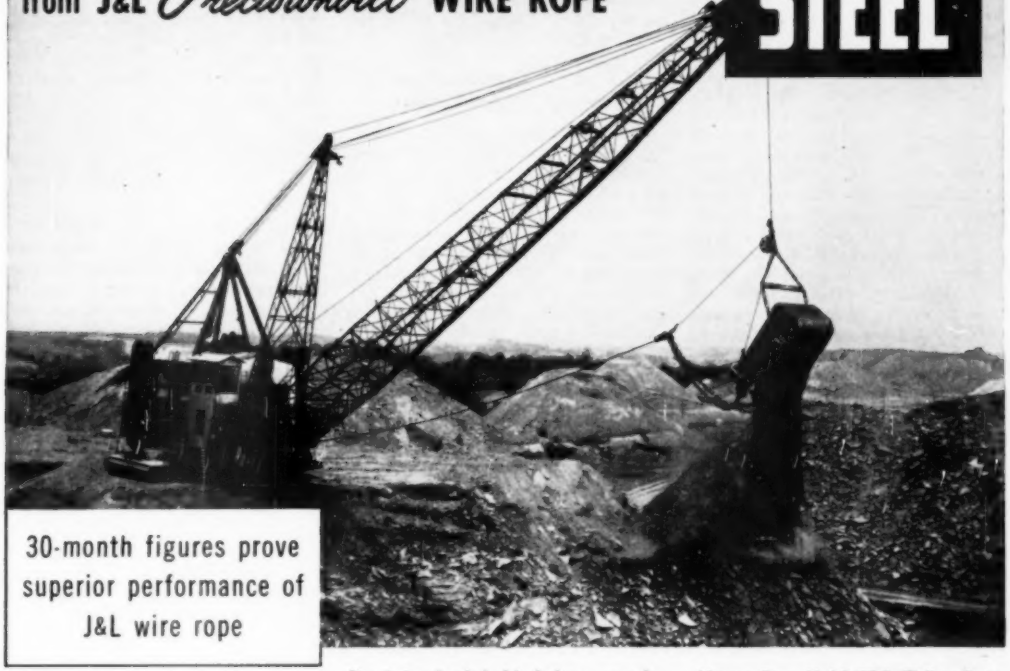
Continued on page 54



• Insert shows general region of Warragamba Dam which will be located on Warragamba River just above the Nepean River crossing. Pipeline and Prospect reservoir are also spotted.

Central Ohio Coal Company* gets L-O-N-G-E-R service from J&L *Precisionbilt* WIRE ROPE

J&L STEEL



30-month figures prove superior performance of J&L wire rope

For two and one half years, Central Ohio Coal Company of Zanesville, Ohio, has kept detailed records on the performance of wire-rope hoisting lines, draglines and dump cables used in their strip-mining operations. These records prove that, among the several different brands used, J&L Wire Ropes gave *more days of service* and moved *more cubic yards of overburden.*

Here are the average performance figures:

Dragline—50% longer service life than competing wire ropes. (J&L Precisionbilt 2¼" dia. Type "U" Lang Lay)

Hoisting Line—30% longer service life than competing wire ropes. (J&L Precisionbilt 1¾" dia. 6 x 37 Lang Lay)

Dump Cable—More than twice the service life of competing wire ropes of ⅛" larger diameter. (J&L CenterFit 1⅛" dia.)

But it is what's behind these records that counts! Both J&L and Central Ohio "know their ropes." J&L knows how to build wire ropes and what type to recommend for every job. Central Ohio knows how to operate them for the longest and most profitable service. This means not only correct application, but also *proper, engineered care.*

—And what is "proper, engineered care?" Why not let a J&L Wire Rope service engineer tell you? He's a specialist in wire rope application. He knows how to get the most out of every inch of hoisting line, dragline, logging rope, marine cable, oil-country line—or wire rope in any other application.

If you would like to have a J&L engineer call on you, write us. The coupon is for your convenience.

Above—*Page, Model 627 S, Walking Dragline, with 12-1/2 yd. bucket. J&L Wire Rope for hoisting line, dragline and dump cable.*

Jones & Laughlin Steel Corporation
429 Jones & Laughlin Building
Pittsburgh 30, Penna.

Gentlemen:

We are interested in learning how to get more service from our wire ropes. Please have a J&L engineer call on us.

Name.....

Address.....

*Affiliated with Ohio Power Company in the American Gas and Electric System.

JONES & LAUGHLIN STEEL CORPORATION

News from the Field

Work on Pan-American Highway Resumed

Interrupted for a several-year period during the war, work is now progressing on the Inter-American Highway, which when finished will run from Laredo, Texas to Panama.

About three-fourths of the highway is now open to travel but sub-standard surfaces in several of the Central American countries prevent touring in wet weather. Construction is being pushed slowly in some of the more mountainous regions because of climatic conditions and extraordinary problems, such as the stretch along the Cerro de la Muerte in Costa Rica where 250,000 cubic yards of dirt per mile must be excavated as compared with 15,000 yards per mile on the Alaska Highway.

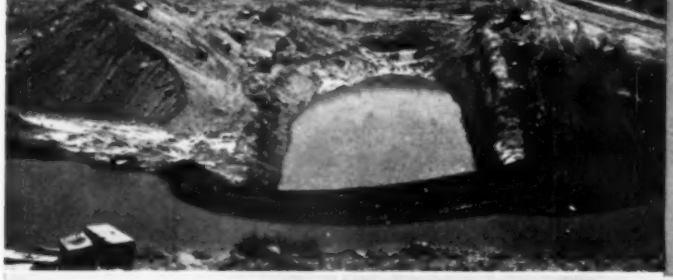
Nearly all of the construction work on the highway is being done with equipment made in the United States. Much of the work was done previously under direction of United States Army engineers and is at present under the Public Roads Administration.

Siphon Contractors Move Creek, Tracks

When the Utah Construction Co., San Francisco, and Winston Brothers, Los Angeles, joint contractors building the East Low Canal of the Columbia Basin project, encountered a stream and a railroad line in eastern Washington, they shifted both to avoid tunnelling for a siphon. The stream, Crab Creek, was moved to a new channel; the tracks, part of the Great Northern Railway, were moved back.

Excavation for the siphon foundation began while the "shoofly" (detour) which was to carry train traffic around the excavation, was being prepared. Crab Creek, a seasonal stream usually dries up early in summer. Because of an unusually wet summer in the Basin during 1948, the creek continued to flow beyond its usual rate. As a result, Utah-Winston diverted the creek around the excavation site for the siphon. A small lake filled with seepage water from the creek was pumped out and the concrete siphon began to take shape between the obstructions.

A Link-Belt Speeder TC-70 truck crane moved reinforcing rings from the bank of the excavation. The rings used are 22 feet, 2 inches in diameter, 1½-in. steel. A Barber-Greene conveyor, equipped with a 30-in. belt, transported concrete from the bank to a hopper on the deck of the siphon for



• Left: Crab Creek runs in new channel here. "Shoofly" is behind and parallel to old roadbed.

• Below, left: Small lake, filled with seepage water, has been pumped out, and concrete siphon begun. Link-Belt Speeder TC-70 truck crane moves steel rings from bank.

• Below, right: Crab Creek, temporarily dammed, was at low ebb while siphon was built. White arrow points to concrete channel, ready for use in case of heavy rains. Barber-Greene conveyor with 30-in. belt transports concrete to deck of siphon.

distribution to proper places in the form.

The flow of Crab Creek began to decline as construction went ahead. While the siphon was being built across the channel, a low dike was built running parallel to the siphon to hold back the flow. A heavy rain would have swelled the flow of the creek. To meet such an emergency, the contractors built a concrete channel over the completed portion of the siphon. The rains did not come and the channel was not used. It was removed late in November.

The entire siphon has been covered and an unlined channel excavated in the fill. Crab Creek will flow in this unlined channel when it begins its seasonal run in spring. The tracks of the railroad were relaid on their old route on a fill over the siphon.

After the siphon is completed and put into use, it will regularly carry irrigation water for 250,000 acres in the Columbia Basin project.

Oakes, Scott Named For Moles Awards

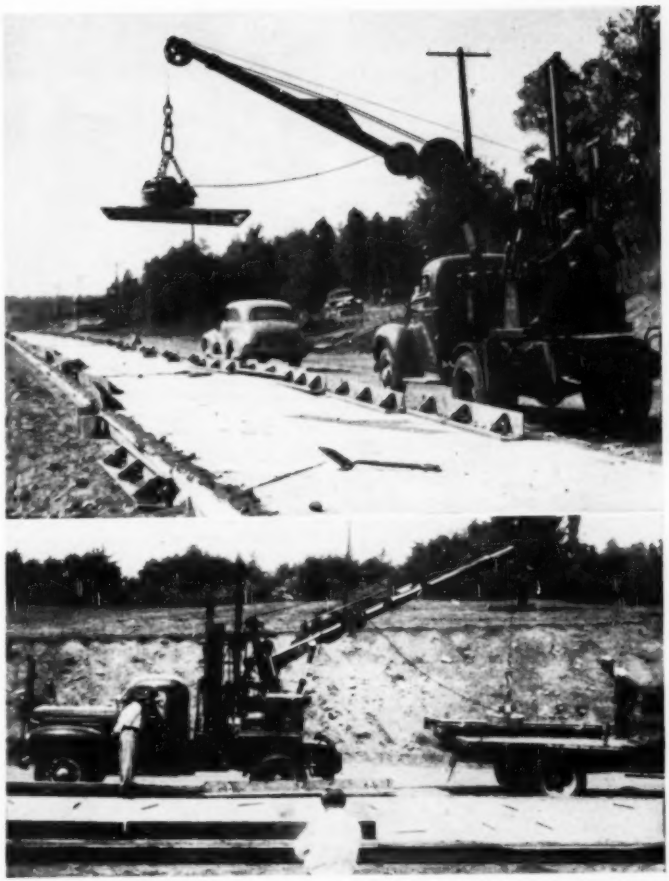
The Moles, New York society of tunnel and heavy construction men, have selected two nationally-known contractors, Luther S. Oakes of Minneapolis, and Thomas A. Scott of New York City, as recipients of the 1949 Moles Award for outstanding construction achievement. The awards will be presented by Moles President J. Rich Steers at a dinner meeting Feb. 9 at the Waldorf-Astoria Hotel in New York.

Luther S. Oakes has been president of Winston Bros. Co. for 27 years. Vermont-born and a graduate of Dartmouth, he joined Winston in 1907 after seven years as a railroad construction engineer, becoming a director in 1913 and president in 1921. The firm is a pioneer railroad builder of the Northwest, and has specialized in railroad, dam, flood control and drainage work throughout North and South America.

Capt. Thomas A. Scott has been a contractor since 1902, when with his father, he organized the T. A. Scott Co. of New London, Conn., specializing in waterfront construction from New York to Maine. In 1922 he consummated the merger of the T. A. Scott Co. with Merritt-Chapman Derrick & Wrecking Co. under the name of Merritt-Chapman & Scott Corp. of New York City. He served as president for many years, and is now Chairman of the Board. The firm is active in heavy waterfront and industrial construction and also does marine salvage and lighterage work.

ARBA in Washington Feb. 7

The 46th annual convention of the American Road Builders' Association will be held in Washington, D. C., Feb. 7, 8 and 9. Technical sessions, luncheons and business meetings are scheduled in three hotels: Mayflower, Willard, and Statler.



• This H-2 Bucyrus-Erie Hydrocrane has done away with one of the big labor problems on Arute Brothers' N. Y. route 29 paving job. Previous to the operation shown, five men were required to pick up and load 9-in. x 10-ft. x 216-lb. road forms on trucks. The Hydrocrane was recently clocked for 40 minutes during which time it loaded out 500 lineal feet of the forms with its 24-in. Ohio magnet and 3-KW generator.

Estimates Indicate Decline In 1949 Construction

Building and engineering volume estimates for 1949 recently released by F. W. Dodge Corp., a fact-finding organization for the construction industry, indicate that moderate declines in physical volume of private residential and nonresidential building and moderate increases in public building and engineering projects are likely this year.

On the basis of information available to the Dodge Corp., the number of dwelling units to be built this year will be 7% less than in 1948, bringing the total for the 48 states to approximately 884,000 from 950,000 units estimated for last year.

Other classifications of building for which declines are anticipated are: commercial buildings, 9%; manufacturing buildings, 15%; churches, and other structures used for religious purposes, 19%; social and recreational buildings, 14%.

It is expected, however, that there will be increases in educational and

science buildings by 10%, and in hospitals and institutional buildings by 11%.

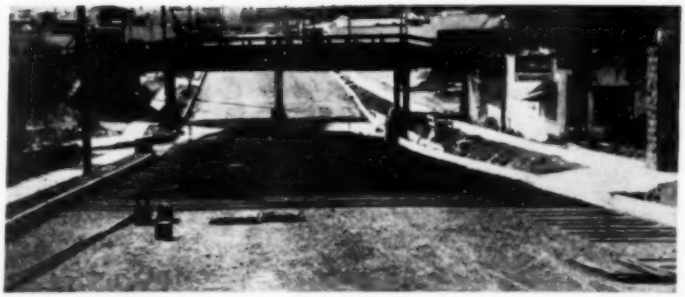
In an analysis supporting these estimates, Thomas S. Holden, president of the Dodge Corp., pointed out:

"Bases of these anticipated reductions are the following facts: buying resistance is being felt in some of these lines already, equity financing has become increasingly difficult, mortgage credit has tightened, confidence of many potential private investors has probably been shaken in some degree by the results of the national election.

"The same factors are likely to affect the volume of private residential building. The home builders responsible for record housing production in 1948 now rather generally realize the necessity of producing and offering for sale houses with lower price tags than those attached to a large proportion of the 1948 output.

"Needs for rental housing continue very great. Recent legislation may stimulate this type of activity. Even if the next Congress should authorize a government housing program involving subsidies, it may not be large enough or effective soon enough to offset probable decline in private building of single-family houses. We have estimated a moderate decline in single-family houses and apartment building equal to the 1948 rate, with the net effect of a moderate decline in total new dwelling units.

"Educational buildings, hospitals and institutions, and public works and utilities projects all seem likely to increase, in view of the status of authorized programs and appropriation commitments. Maintenance and repair work and farm building, which are not included in the estimates are more likely to decline somewhat than to increase, we believe."



• These wrought iron pipe coils will keep a steep 450-ft. stretch of highway in Klamath Falls, Oregon, clear of ice and snow. Water heated in a natural spring circulates through the pipes.

Oregon Town Gets Snow-Melting Highway

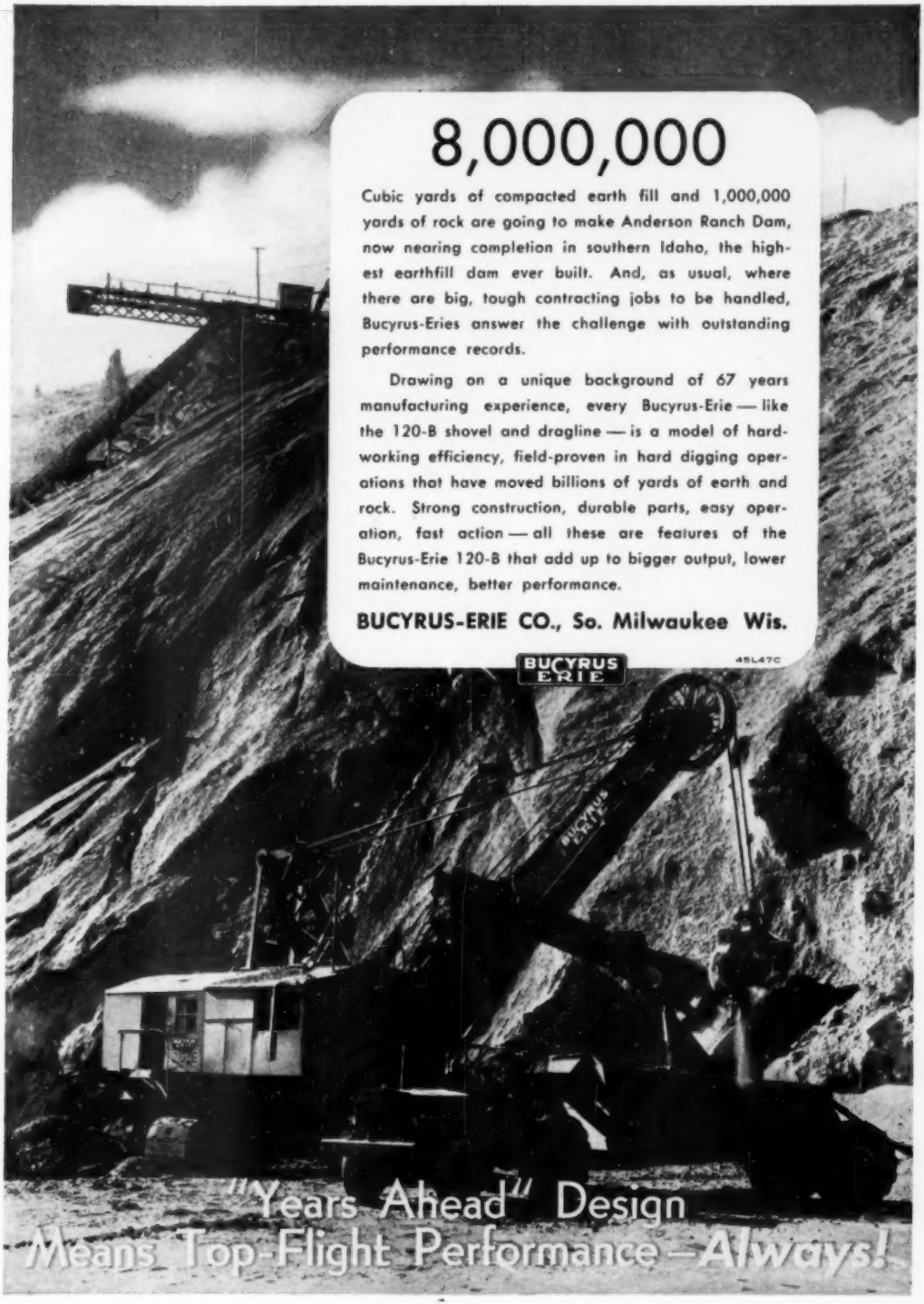
The dream of every motorist and every highway engineer—a snow-melting highway—is about to be opened in Klamath Falls, a town in southern Oregon. A short section of the highway will be heated in bad weather by natural hot water from an underground spring circulated through a network of welded wrought iron pipe laid in the concrete. The road will be kept clear and skid-free in all weather by automatically melting up to one inch of snow or 1/10 inch of ice per hour.

Four lanes wide, 450 feet long with an 8% grade, the stretch of all-weather heated pavement is on the Dallas-California Highway leading into Klamath Falls from the north. It passes under the Southern Pacific Railway viaduct and a few hundred feet farther crosses an irrigation ditch, thus necessitating a grade 2 or 3% steeper than normal. Plans call for completion of the work at the end of this month.

Work was started on the road late last spring after a 10-in. well had been drilled which struck a good flow of hot water at 390 feet. The hot well water

Continued on page 34

• Fruin-Colnon Contracting Co., long-established firm of St. Louis, Mo., recently called together 33 of its active veteran employees to make possible this remarkable photo representing 1000 years of construction service. First row, left to right: Arthur Mueller, Michael Houlihan, Charles Caress, Joseph Brunetti, Sr., Joseph Vollmar, Chairman of the Board Albert Greensfelder, Edward Dicke, Albert Wenthe, Lindley Milford, Alexander Bremer and Henry Witte; second row, Thomas Barman, Malvin Anderson, John O'Connell, Jack Lauff, Daniel Mackin, Carolyn Dummeyer, Percy Ramsay, Frederick Caress, George Staurton, Victor Witte and Harry Kutter; third row: William Baldwin, Anthony Herrmann, John Mueller, Robert Badock, Herman Mayer, Otto Brockmeier, William Duffy, George Gebhardt, Floyd Ruyle, Charles Boehmer and Peter Brambilla. Chairman Greensfelder has been with Fruin-Colnon for 42 years; Mr. Dicke, 41 years.


8,000,000
Cubic yards of compacted earth fill and 1,000,000 yards of rock are going to make Anderson Ranch Dam, now nearing completion in southern Idaho, the highest earthfill dam ever built. And, as usual, where there are big, tough contracting jobs to be handled, Bucyrus-Eries answer the challenge with outstanding performance records.
Drawing on a unique background of 67 years manufacturing experience, every Bucyrus-Erie — like the 120-B shovel and dragline — is a model of hard-working efficiency, field-proven in hard digging operations that have moved billions of yards of earth and rock. Strong construction, durable parts, easy operation, fast action — all these are features of the Bucyrus-Erie 120-B that add up to bigger output, lower maintenance, better performance.
BUCYRUS-ERIE CO., So. Milwaukee Wis.
BUCYRUS ERIE
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"Years Ahead" Design
Means Top-Flight Performance—Always!

POWER!

PRODUCING AGGREGATE

CRAWLER TRACTORS
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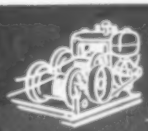
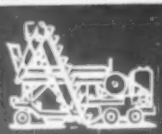
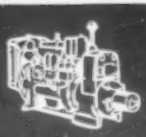
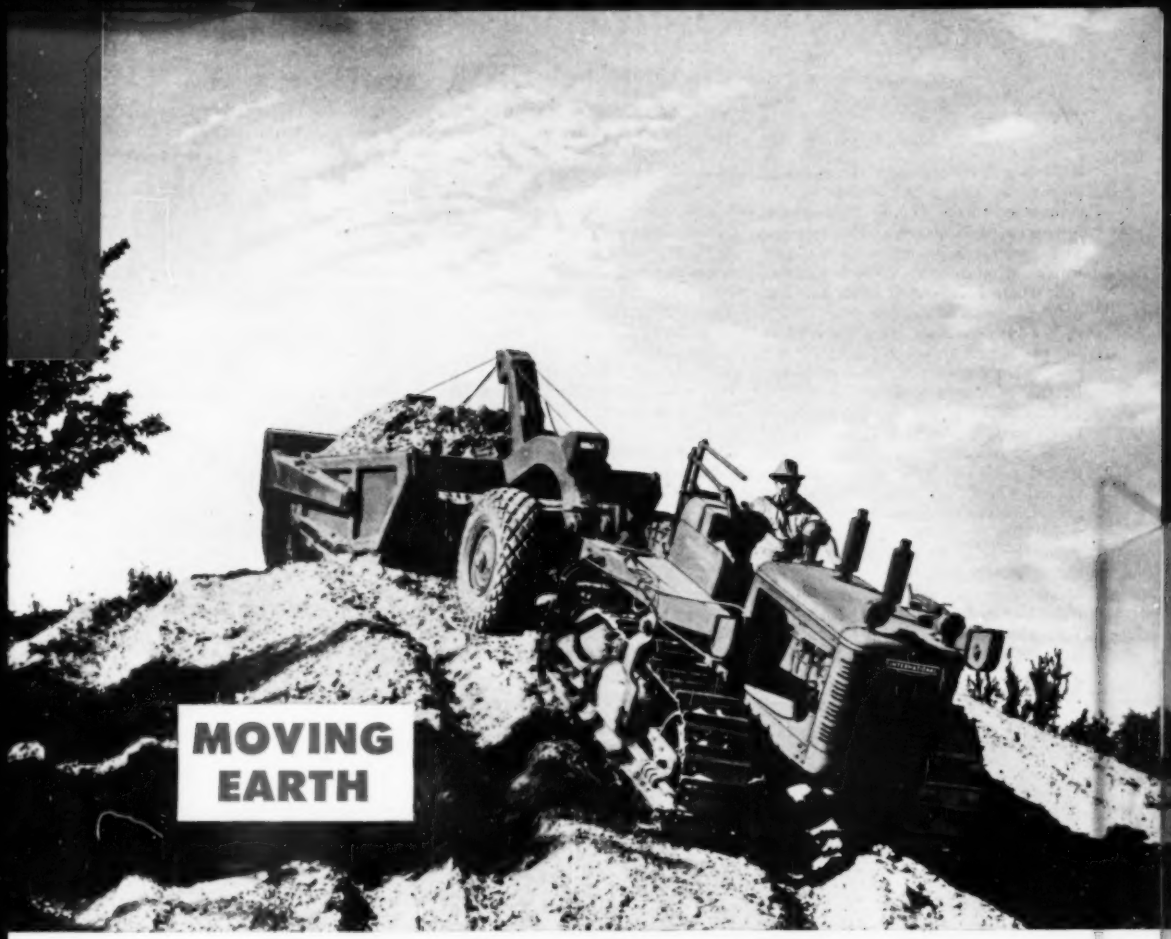








INTERNATIONAL ENGINES — **powering tractors or power units—deliver rugged, low-cost power that cuts operating costs to rock bottom.**

Producing aggregate the International UD-18A is one of three International Power Units driving a rock crusher. The low operating cost of these power units is an important factor in profitably meeting the competitive price of crushed stone.

Moving earth to clear the way for a hospital addition is the task of the International TD-18 Diesel Crawler and matched scraper. Averaging 120 yards per hour, the TD-18 did a fast, profitable job of moving a total of 10,000 yards.

You just can't beat International Power for peak production and low operating and maintenance costs. Visit your International Industrial Power Distributor and let him show you how International Tractors and Power Units will produce more profits on your projects.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

Listen to James Melton on "Harvest of Stars" every Wednesday evening—CBS

INTERNATIONAL HARVESTER

Industrial Power

Continued from page 30

itself is not run through the roadway piping. Instead, a coil of 2-in. pipe is submerged deep in the well water, testing at 190 degrees, thus serving as a boiler. A pump sends ordinary water and anti-freeze through the well coil, where it is heated or reheated to not less than 160 degrees.

A 2-in. pipe runs from the well to the pavement, and then parallel to the road for a distance of about 400 feet. In the pavement slab are embedded 15,000 feet of ¾-in. wrought iron pipe made up into one grid for each of 15 30-ft. road panels. Each panel is connected with the 2-in. water main by valves. The 2-in. main and series of grids comprise a closed circuit through which heated water is pumped, the valves insuring an even flow of water through each grid.

The pipe carried a coating of asphalt before being laid in the concrete. Wrought iron was used in the installation because of its resistance to corrosion and because its coefficient of expansion is virtually the same as that of concrete, thus keeping the bond and minimizing the danger of cracking the concrete.

The pump, thermostatically controlled, automatically begins to circulate the water when air temperature drops to freezing and continues to operate until the temperature rises above freezing. Another pump draws water from the well because it loses its heat value as the cool water flows from the road through the heat transfer coils. Water for the well is then replenished by hot water from the underground springs.

Geologists believe water in the spring is heated either by underground lava or by chemical reaction.

Pulaski Skyway Designer Retires

Sigvald Johannesson, 71, chief of the Bureau of Planning and Economics in the New Jersey Highway Department retired recently after nearly 25 years of outstanding service. One of his first jobs in the department was the designing and engineering of the $20,000,000 Pulaski Skyway, built in the 1920's between Newark and Jersey City to carry through traffic to the Holland Tunnel.

The Danish-born Johannesson developed the idea of moving concrete pavement sideways with compressed air when the highway department was trying to widen the New Brunswick pike between Trenton and Penns Neck. He also supervised the construction of a new department laboratory at Fernwood, N. J., and is the author of the revised standard State Highway Department specifications.

Before joining the New Jersey department, Johannesson assisted in the design and engineering of the construction of the Pennsylvania Railroad tunnels under the Hudson River and the reconstruction of New York elevated railways. After his graduation from the University of Copenhagen he worked in London on deep level tunnels and municipal improvements prior to coming to the United States.

The veteran engineer plans to live in California.

• M. F. Brown, Inc., NYC, is wrecking the car barns of the Third Avenue surface lines to make room for New York Life Insurance Company's housing project. Brown's contract provides $74,000 for demolition and $27,000 for grading on the block-square job. Above, rubble is loaded to a 10-yd. Mack A. C. dump by a 1½-yd. Northwest 362 shovel. Clearing at left is a Caterpillar-D6-mounted LaPlant-Choate bulldozer.

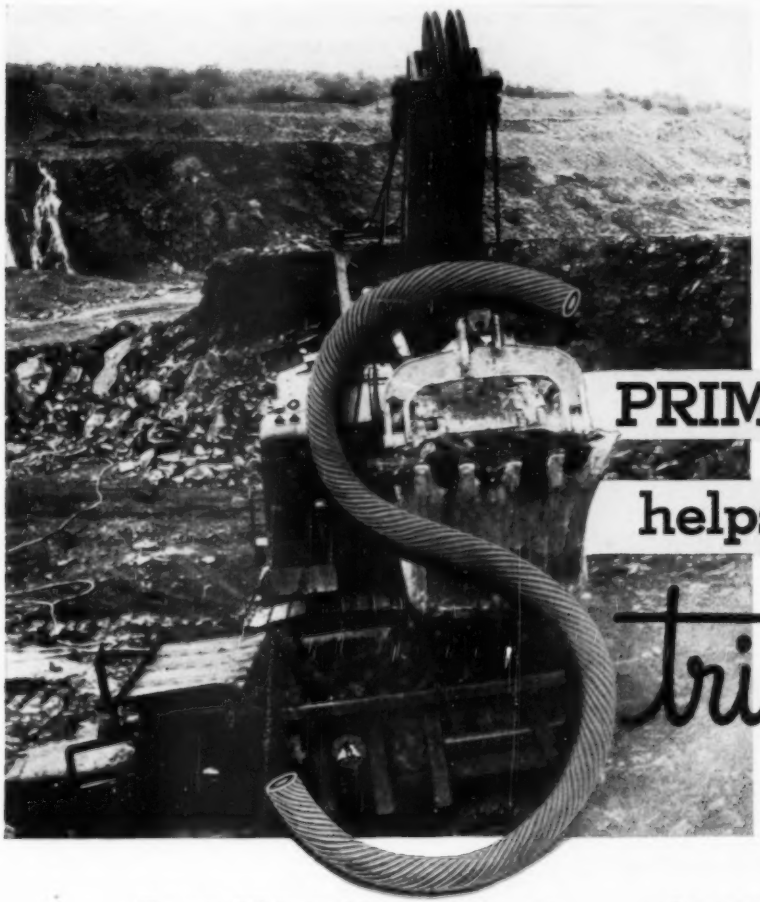
Atomic City Gets New Business District

On the Columbia River in southeastern Washington, 160 miles southwest of Spokane, lies Richland, headquarters for General Electric's Hanford Works, one of the projects for the Atomic Energy Commission. Back in 1943, its 242 residents were engaged, for the most part, in fruit growing. But with the construction of Hanford Works, it mushroomed into a modern, planned city of 15,000 with about 45 new businesses going up.

Originally Hanford Works was going to be abandoned after the war; instead, its facilities are being expanded. A minimum permanent population of 25,000 is expected. The expansion of Hanford Works and the enlargement of Richland is being done at a cost of more than $350 million.

The business district was expanded by the addition of 100 new stores and offices. One of the two new sites, roughly four blocks long and 1½ blocks wide called for the excavation of 75,000 cubic yards and the diversion of a stream into an underground culvert. The principal problem was proper care of the ground water which flowed into the 20-ft. culvert excavation. As many as 10 pumps, ranging in size from four to 10 inches, were kept in almost continual operation to carry off the water as the culvert ditch was dug, forms placed and concrete poured.

Continued on page 38



How PRIMACORD helps boost stripping

The use of Primacord boosts stripping tonnage by initiating explosive charges to produce well-broken ground. And well broken ground keeps shovels digging . . . trucks moving . . . with pay-dirt in every load.

Here's how: You *plan* trunk line hookups with Primacord so that front holes go a split-second before succeeding holes. The resulting relief of burden *boosts fragmentation.*

Primacord down-hole branch lines are in contact with the entire charge. When you fire, every dynamite cartridge explodes with the power of a primer cartridge . . . *boosting fragmentation.*

Insensitive to stray currents, Primacord is the logical detonator to use wherever high-voltage electrical equipment is on the job. Flexible, easy to handle, Primacord hooks up quickly with square knots and half-hitches . . . comes wound on lightweight spools that speed up loading operations.

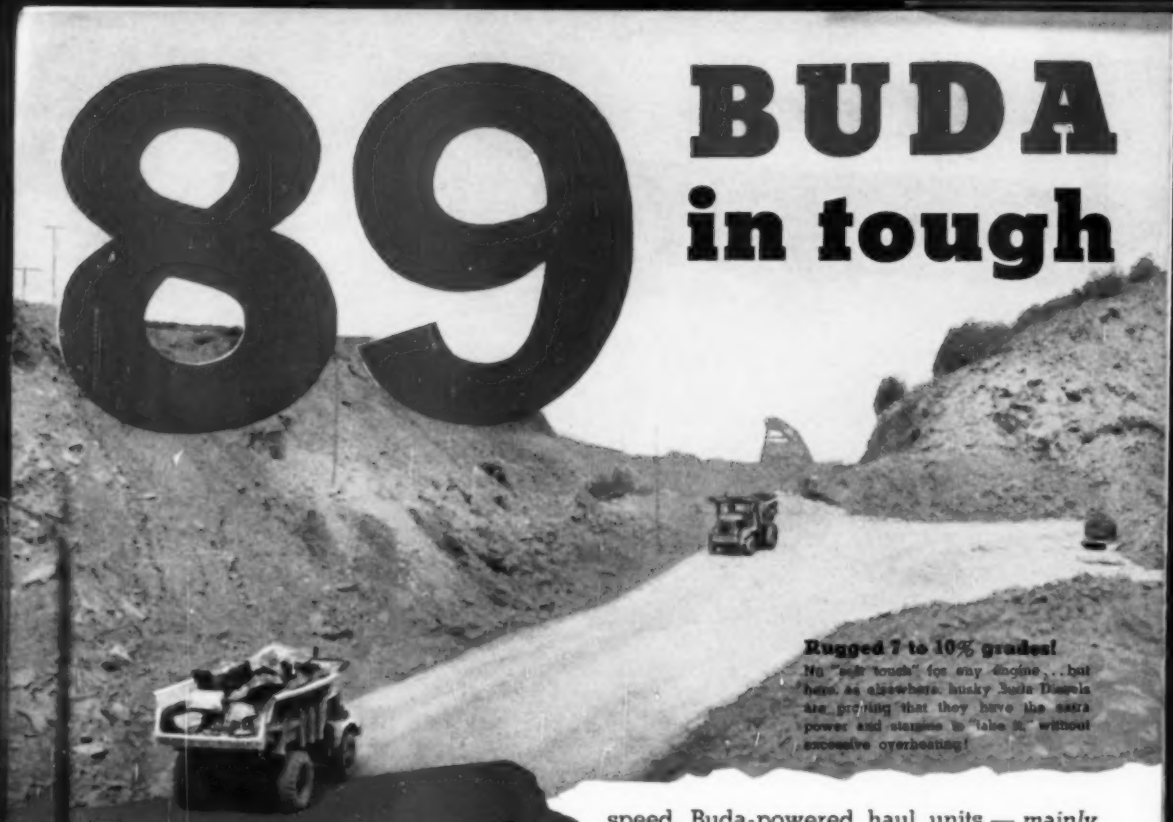
Primacord is available in three types, designed to meet every blasting condition. Ask your supplier for the full Primacord story — or write us direct. The Ensign-Bickford Co., Simsbury, Connecticut.

P-20

PRIMACORD-BICKFORD Detonating • Fuse •

Also Ensign-Bickford Safety Fuse Since 1836

89 BUDA in tough



Rugged 7 to 10% grades!
No "soft touch" for any engine . . . but here, as elsewhere, husky Buda Diesels are proving that they have the extra power and stamina to "take it" without excessive overheating!

5 Leading strippers prove Buda Economy in Pennsylvania Anthracite Region

In this great equipment proving ground of eastern Pennsylvania — which today produces virtually 100% of U. S. Anthracite — modern Buda Diesels are playing a major role in safe, economical removal of coal by stripping. Since 1946, five big-time strippers:

Carey, Baxter & Kennedy, Inc. **Dewees Bros.**
Hartranft & Ryan **McCall, Inc.**
Shen-Penn Production Co.

have brought in a total of *89* new high-speed, Buda-powered haul units — *mainly big "Eucs," Macks and several LaPlant-Choate Motor Scrapers*—to help move many million cubic yards of overburden and coal. In addition, *26* more Buda Diesels are on order, for new rigs, conversions and spares. This makes a total of *115* modern Budas operating, or on order, for this one coal-producing area alone!

Tough conditions...grueling schedules!

Teamed with 4 and 6-yd. strippers, Buda-powered haul rigs of various sizes are handling 22 to 30-ton loads per trip, over average hauls running 2000' to 3000'... mostly uphill, against rugged 7 to 10% grades! Production is at break-neck pace ... 19 to 27 loads per 7-hr. shift ... 3 shifts daily ... 6 days per week ... *all year 'round!* This calls for approximately 5000 operating hours per truck-year ... all kinds of weather ... all kinds of drivers ... as tough a test as any engine ever had to meet!

CLIP... MAIL TODAY

The BUDA COMPANY, Harvey (Chicago Suburb), Illinois

Rush specifications and mounting dimensions covering Buda 8DC-1125 Diesel ☐ Fan-to-flywheel type ☐ Power Unit.

NAME _____ TITLE _____

EMPLOYED BY _____

ADDRESS _____ CITY and STATE _____

Also send details on other Buda engines (5 to 440 h.p.) for _____ Size _____ h.p. _____

DIESELS take over strip mine haulage!

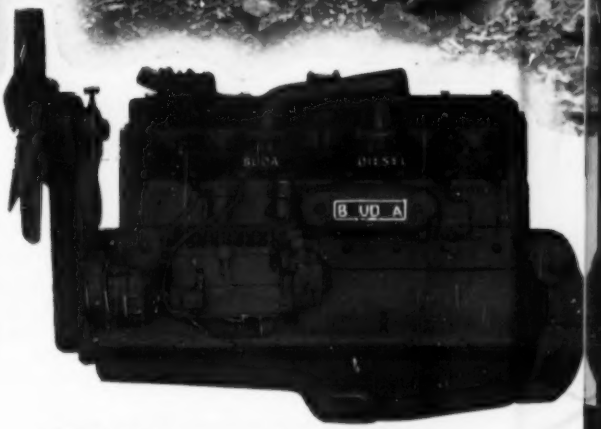
Big 22 to 30-ton loads!
Plenty of engine torque needed here, to move such big loads uphill from dead stop... yet modern Buda Diesels are doing the job 21 hrs. a day, 6 days a week, with minimum upkeep!

Average 6000 hrs. between overhauls

Despite this terrific beating, at least one Buda 844 Supercharged Diesel has delivered over 8700 hrs. of continuous operation —without removing head, or dropping pan. Other Buda 844 Supers and big 8-cylinder 1125's are averaging a "healthy" 6000 hrs. between major overhauls — *generally at least half again better than competitive Diesels used on same hauls.*

Trend to Buda Diesel Fleets

As a result of this superior on-the-job performance, one fleet of 73 haul units has already gone 100% to Buda Diesels. Other fleets are being converted to Buda as rapidly as new engines are required. W. J. McCall, Supt. of McCall, Inc., Tamaqua, Pa., comments: *"Our records indicate clearly that the life of Buda Diesels is about 3 times that of Diesels previously used, so naturally, we are adding Budas from now on."*



YOU, TOO, can cut costs with this big 1125 cu. in. Buda Diesel!

Because it gets more work done with less effort... gives more power, longer life on tough jobs, this big 8-cyl. Buda Diesel is rapidly gaining top preference for big haulage equipment. Operators and mechanics also like its smooth, quiet, smoke-free operation... its easy accessibility for service and repairs. Mail coupon for details.

BC-2

BUDA

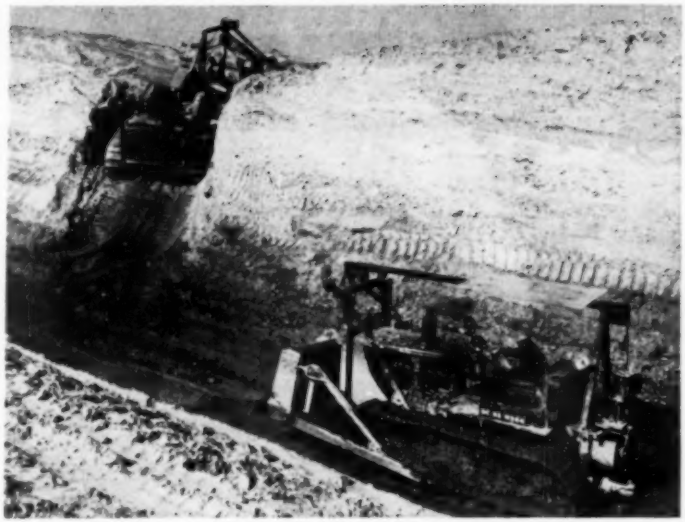
... a Power-full name in ENGINES

Continued from page 34

The culvert is five feet high, six feet wide and 4,000 feet long with walls eight inches thick.

Leveling on the site was done by four Caterpillar D-7 bulldozers, a 1½-yd. Koehring dragline, and a 12-yd. LeTourneau carryall. To speed the work, excavation went on every night under floodlights.

J. A. Terteling and Sons, Boise, Idaho, held the contract for the job. H. A. Taylor was project manager, and James M. Erwin, chief engineer, for the contractors.



● A 12-yd. LeTourneau carryall and a Caterpillar D-7 dig a 20-ft. culvert ditch which diverted a stream on the site of a new business district in Richland, Wash., growing from a pre-war population of 242 to one of 25,000.

One-Man Flood Control Project in Beloit, Wis.

Every spring, an ordinary narrow and quiet creek flowing through Beloit, Wis., swells to destructive proportions and rampages over miles of adjacent city and private lands. At such time, the flood crest usually stands four or five feet over Boulevard Avenue Bridge, halting traffic and inflicting thousands of dollars of property damage.

Last year a Beloit businessman decided to fight the floods single-handedly. Although Beloit itself suffers extensively from this annual wrath, John Strasburg, president of the Strasburg Lumber & Fuel Co., made up his mind he was through waiting for government action—federal, state or otherwise.

With a ½-yd. Unit dragline and an HD-5 Allis-Chalmers-mounted Tracto-Shovel, Strasburg started moving 300,000 cu. yds. of creek sand and gravel to make room for a wider Turtle Creek stream. By the end of August he had converted about a mile of the small 12-ft. channel to a 120-ft. wide river flanked by high banks on both sides. The entire job is costing about $3,500, including the "rip-rapping" of both banks.

According to Strasburg, the project is simply a matter of property protection: "If the federal government and the cities get going according to plans, the money I'm saving them now may be spent to improve conditions later. When the work is completed, both the city of Beloit and my adjoining property will be assured permanent protection."

● Beloit's (Wisconsin) creek is widened by an HD-5 Allis-Chalmers-mounted tractor-shovel which pushes sand and gravel to bank where it is loaded out by a ½-yd. Unit dragline. The tractor worked in water up to four feet deep.

Utah Programs Postwar State Road Funds

Utah has programmed all of its postwar state road money with the exception of urban highway funds, according to the biennial report of the State Road Commission.

Of a postwar road fund of more than $18,000,000, about $1,000,000 remains to be programmed, representing two years' accumulation for urban highways. Roy W. McLeese, chief engineer of the commission, explained the urban fund could not be committed until the Salt Lake City westside expressway is definitely located.

The commission's report listed the total cost of 206 miles of primary roads constructed with postwar funds as $10,146,698. Twenty-five primary projects are completed adding 95 miles of highway at a cost of $4,998,101; underway, 15 projects totalling 74 miles, at a cost of $3,791,096; in process of preparation, two projects totalling 24 miles, at a cost of $807,500.

Total cost of the Utah programmed roads of all types was listed as $17,242,734, of which the federal government pays 70 per cent.

Construction costs of state roads totalled $5,869,260 in the past fiscal year, compared with $4,970,351 in 1947.

Continued on page 45

Completely New! Different! Hydraulic!

It's simply amazing — there's no other crane like it — in operation, performance or utility. Because it is completely hydraulic, the Hydrocrane is more simple — there are no brakes, clutches, gears or drums — thousands of parts have been eliminated, making it more economical to own and operate than any other type of crane.

Its ease of operation assures greater operator efficiency all day long—finger-tip hydraulic control over every operation is simple, positive, precise and safe.

The Hydrocrane is small and compact, works in congested low overhead areas where other cranes cannot operate. The telescopic boom provides long reach and the outriggers extra capacity and stability without dead weight. Hydraulic bucket digs in with *all* its weight, gets bigger payloads with its full penetration design.

A Hydrocrane is the most profitable crane investment you can make — it will pay for itself many times over in economy, performance and extra utility.

6H48

MAIL COUPON TODAY!

BUILT IN 2 SIZES

Model H-2, 2-Ton, ¼ Yd. Model H-3, 3-Ton, ⅜ Yd.

BUCYRUS-ERIE, HYDROCRANE DIV.
7923 W. Greenfield Ave., Milwaukee, Wis.

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Ideas on the Job

Installation of Spring Loaded Oil Seals

It takes a good oil seal to retain the oil in gear cases of excavation and hauling equipment under ordinary circumstances, and an even better seal when traversing hilly terrain where the oil level is often higher than the oil seal itself. In one way or another, in today's operations, these latter conditions are constantly encountered.

A point of perfection must be reached not only in the manufacture of seals, but also in their installation, if complete sealing results are to be expected. As an aid to the men who install seals in the field, the accompanying diagrams with their explanations are presented. When oil leakage occurs, it may be that the seal was damaged when installed or that the oil level is too high. However, if recurrence of oil leakage is experienced on a field installation, the cause is probably improper insertion of the seal, causing damage to the sealing lip by forcing it over rough surfaces of a shaft, or distortion of the seal case by driving it in place with a hammer.

Fig 1

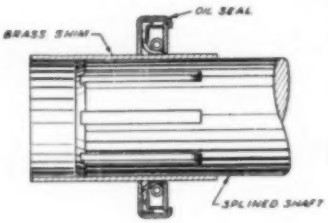
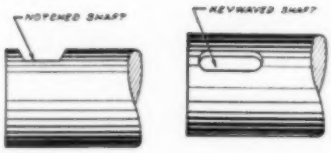


Fig. 2



When new seals are installed, be sure to remove any excess end play or eccentricity of the shaft. The life and effectiveness of a seal largely depend on this adjustment. Should a shaft have to be installed through a seal which is in place, as much weight as possible should be taken off the shaft, or the seal is likely to be damaged in assembly.

Before installing, always submerge seal in oil or coat it with grease to facilitate assembly and prevent damage when the machine is started. Surfaces on the shaft where the sealing member contacts the shaft should be polished smooth with fine abrasive cloth, adding to seal life.

Figure 1 shows the method by which a piece of brass shim stock is used to slide the seal over the splined end of a shaft. Ends of the shim stock must overlap in proper cylindrical form and care should be exercised that the shim stock has no rough edges that will damage the sealing lip.

Figure 2 points out that when oil seals must be installed on keywayed or notched type shafts, the procedure as followed in Figure 1 can be used.

Fig 3

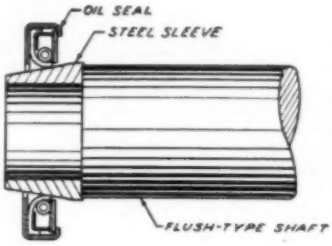


Figure 3 shows how, on a flush-type shaft, a steel sleeve fitting up against and very slightly over the shaft is used to protect the sealing lip. Care must be exercised to avoid stretching the sealing member beyond its working diameter. To guard against damage of the lip, the outside diameter of the sleeve should be polished.

Fig. 4

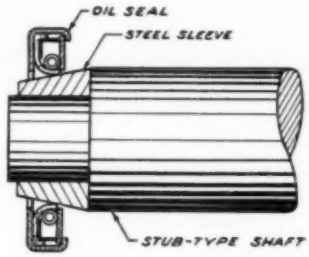


Figure 4 diagrams the stub-type shaft and shows how a steel sleeve is made to fit over the stub and up against the shaft face with the largest diameter the same as, or very slightly larger than, the shaft. Again, care must be taken that the seal is not stretched. The outside diameter of the sleeve should be polished. For applications 3 and 4 suitable sleeves can be made locally at small cost to fit any size and type shaft.

Figure 5 shows how a driver can be easily constructed for use in installing seals in bearing caps. For occasional installations, the old seal or a flat plate larger than the seal can be used. Too many times mechanics drive seals in place with a hammer, and by the time the seal is in place it has been distorted to a point where the seal can-

Continued on page 44

• The Illinois Central Railroad recently solved an annoying slide-control problem near Flora, Miss., by reducing the grade of the hillside to 25%—well under the sliding point. The International-mounted Bucyrus-Erie TD-18 Bullgrader shown above pushed soft, muddy soil up out of the ditch to be loaded by the International-drawn 8-yd. Bucyrus-Erie S-90 scraper. The scraper carried the material to a dump ½ mile away. Final clearing of the ditch was done by the Northwest dragline.

PLUS Power . . Speed . . Mobility

FEATURING . . .

1½ Cu. Yd. Capacity
Hydraulic Bucket Control
Hydraulic Down-Pressure
Rear-Wheel Power Steering
Automatic Tip-Back Bucket
Four Forward Speeds
2 to 16 mph
Four Reverse Speeds
3 to 24 mph

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on the Model HM or on other sizes of Hough Payloaders—the 1¼ cu. yd. Model HL, the ¾ cu. yd. Model HF, the 10½ cu. ft. Model HA.

Here is an entirely new experience in earthmoving — an entirely new conception of the work capacity and job capacity of a rubber tired tractor shovel. Here is an entirely new tractor shovel—revolutionary in design—revolutionary in performance.

Big and powerful, the 1½ Yd. Model HM PAYLOADER provides tremendous digging power and ground-gripping traction for tough going in rock, sand, mud, muck or *any* terrain. With 4-Wheel Drive on large rubber tires it provides traction comparable to a crawler tractor—plus more speed, greater mobility, easier maneuverability and *far less maintenance expense.*

Compact design, short wheel base and power boosted rear wheel steering enable the HM to operate in close quarters. It has four speeds in either direction and quick acting forward-reverse control. Double acting finger-tip hydraulic control raises — lowers — dumps and closes the bucket . . . provides powerful down pressure for tough digging. Get the complete story on this new PAYLOADER from The Frank G. Hough Co., 708 Sunnyside Avenue, Libertyville, Illinois.

SAY "HUFF"

HOUGH
PAYLOADER
Manufactured by THE FRANK G. HOUGH CO.

2 mining companies

Three Point Coal Co.

"HOGS" OUT 45' ROCK HIGH-WALL WITH "C" TOURNADOZER

To get at coal seam close to edge of mountainside, Three Point Coal Company is stripping off a 45-foot cliff face, near Three Point, Kentucky. Overburden is 90% rock . . . blasted, then dozed off the ledge.

Doubles Crawler Output

It's rough going all the way, from initial stripping to cleaning coal seam. Fastest dozer on the job is Three Point's rubber-tired "C" Tournadozer . . . "does about twice the work of a crawler on my straight dozing," reports H. F. Rhodes, mine superintendent. Tournadozer makes faster cycles on the short 0-to-200' one-way push, because there's no time lost for shifting gears . . . no foot clutching.

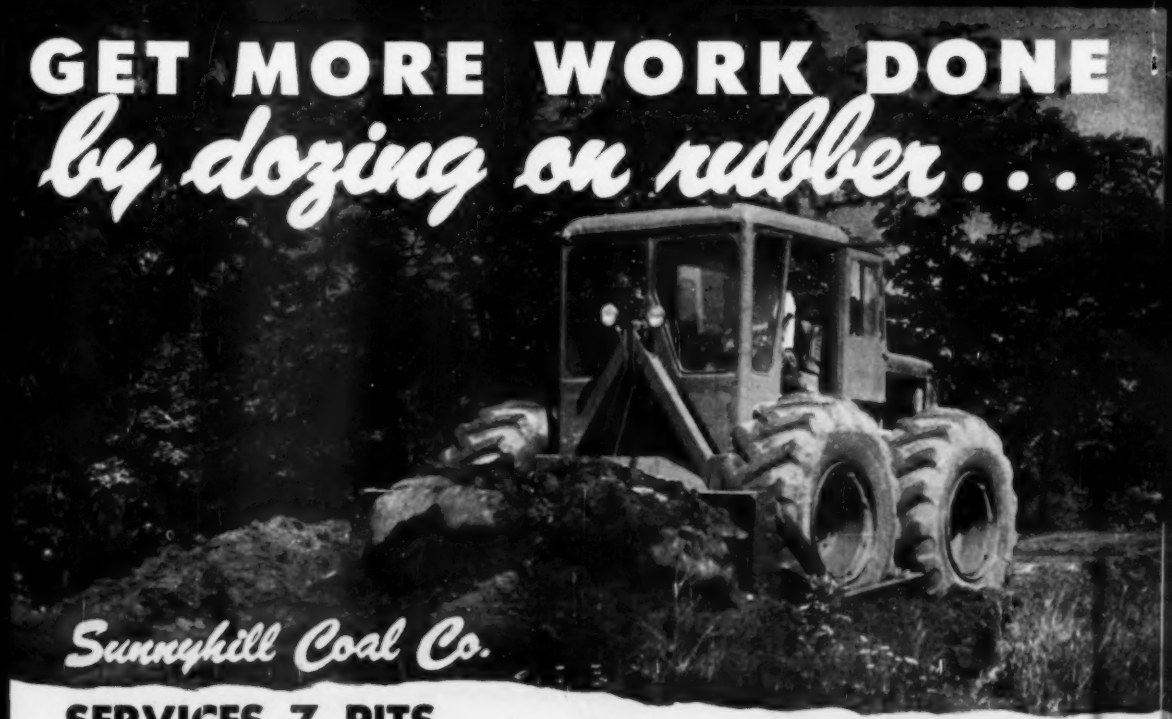
Handles Extra Assignments Fast

Tournadozer's speed pays off on extra assignments for Three Point Coal Co., too. They used it to build mine access roads up the mountain . . . and frequently drive it some 12 miles over state highway to Harlan, Kentucky, to handle extra construction work. To get to the "outside" Tournadozer has to travel through a railroad tunnel, the only access to and from the mine. But Tournadozer got in and out of the tunnel fast . . . no planking necessary . . . travels 15 m.p.h. under its own power over highway . . . no waiting for flat-bed or trailer.

Dozing heavy "shot" rock in Three Point, Ky. mine, Tournadozer's 4-wheel drive on giant 21.00 x 25, low-pressure tires, and 180 h.p. Diesel, put plenty of power and traction behind its extra-large blade.

Tournadozer — Trademark Tournapull — Trademark Reg. U.S. Pat. Off.

GET MORE WORK DONE *by dozing on rubber . . .*



Sunnyhill Coal Co.

SERVICES 7 PITS IN 8 HOURS WITH *"C" TOURNADOZER*

Busiest rig around Sunnyhill Coal Company's mine at New Lexington, Ohio, is their 15 m.p.h., rubber-tired "C" Tournadozer. "In an 8-hour shift, we clean around shovels in 7 pits, scattered over a 3-mile area," reports Paul Beal, one of the Tournadozer operators. "It used to take 4 or 5 dozers to do this work. It really gets around . . . went 8 miles in 26 minutes . . . did the job and got right back. Would have taken a crawler a whole shift, and we would have had to use a low-boy to get it there."

Handles Emergency Switching

"Last winter, when 4 coal cars got derailed, I used the 'C' dozer to push them off and clear the track . . . also spotted cars with it when our dinky broke down. It's the best thing I've seen for crossing tracks . . . crosses any place without ties." Sunnyhill's Tournadozer also strips overburden, cleans coal seam, builds roads, push-loads scrapers on its 24-hour-a-day schedule.

Tournadozer's ability to get more work done has won enthusiastic approval of scores of mine owners and operators. With its 180 h.p. 4-wheel drive . . . 15 m.p.h. speed, forward and reverse . . . instantaneous speed selection . . . and giant, low-pressure tires . . . you've got "dozer dynamite on wheels." Send for complete facts . . . or see your LeTourneau Distributor TODAY.

To: R. G. LeTOURNEAU, INC., Peoria, Ill.

Send following facts on 180 h.p. "C" Tournadozer:
☐ Specifications ☐ Price ☐ Delivery

Name_____ Title_____

Company_____

Street_____

City_____ State_____

Type work to be handled_____

Also send information on: ☐ Big 300 H.P. "B" TOURNADOZER
☐ 30-Yd. ☐ 13.3-Yd. ☐ 7-Yd. TOURNAPULLS

C109

LETOURNEAU PEORIA, ILLINOIS — HIGH-SPEED RUBBER-TIRED **TOURNADOZERS**

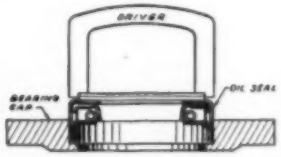
IT'S RUBBER THAT PUTS THE ACTION IN TRACTION

Ideas

Continued from page 40

not function properly. By use of a driver properly made, the strain is applied to the outer structure of the steel case. When available, a press should be used. If manual effort is used to drive the seal in place, care should be exercised to distribute the driving force evenly around the outer edge of the seal. Do not allow the

Fig 5



seal to become cocked during its installation. By applying white lead to the bore of the bearing cap into which the seal is to be installed, a better seal against leakage will be obtained.

Sealing direction is determined by the purpose of the seal on the shaft. Where the housing contains lubricant which must not leak out, the sealing member lip should be faced toward the lubricant. Where the purpose of the seal is to permit expulsion of matter, the sealing lip should be faced away from the housing.

Generally speaking, spring loaded oil seals will retain oil if properly installed. Following these installation directions, it is possible to correctly place seals in position, without fear of damage to the seal.

—Allis Chalmers Tractor Division, Service Department

Thermal Boring in Rock

Several contractors have put into use the Lebrun process of thermal boring, using the oxygen lance, for vertical foundation holes under both wet and dry conditions, and for horizontal boring in construction, demolition and quarrying. The method is especially adapted to highly siliceous rocks and heavily reinforced concrete.

A stream of oxygen is passed through a steel or iron tube packed with wire, the ratio packing to tube diameter being critical. The tube is ignited at the working end, the metal burning in the oxygen and forming with the silica in the rock a fluid slag through which penetration progresses at the rate of about 5 inches per minute. Calcareous and other basic rocks are very difficult to bore unless powdered silica is fed into the bore-hole. Horizontal borings are self-clearing, but the slag tends to run back in vertical dry borings over 10 feet deep, while pockets of molten Fe_2O_3 may be formed.

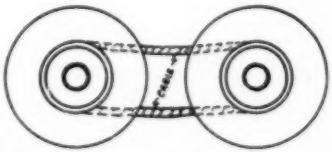
These conditions may be avoided by projecting properly timed shots of water into the point of the lance so that the flashed steam ejects the slag. It is possible with this process to bore in a depth of 12 feet of water, and it has been successful in boring, under 16 inches of water, a series of 11-in. diameter wells, and smaller holes, in the damaged reinforced-concrete lining of a canal so that injections of cement could be effected and thus repair the structure.

—Highway Research Abstracts

Rock Rejector

Loops of cable are being successfully used by the Kuckenberg Construction Co., Portland, Ore., on their North Santiam Highway project (August *Excavating Engineer*) to keep sharp rocks from wedging in duals and wearing the tires.

Discarded steel cables are spliced into short loops just long enough for a loose fit between the wheels of tan-



dem-axled trucks. The loops are placed between the two tires of each axle. As the truck moves forward, any rocks wedged between the tires are automatically flipped out as they revolve and strike the cable. The loose cable also revolves with the wheels, giving little or no chafing against tires.

—Tom Riley

Broken Stud Removal

Here's how a welding outfit can be used to remove a broken stud in a hurry. First, place an amply large nut directly over the broken stud. Then, build up the stud by welding onto it, and finally weld the stud to the nut. The stud and nut become one solid piece and can easily be taken out with a wrench.

—W. F. Schaphorst

"Excuse me, gentlemen, but if you wish to reduce the amount of undercutting why not create a hydraulic pressure by running water down between the piling and the clay columns?"

News

Continued from page 38

Four States Approve Road, Airport Proposals

A state constitutional amendment requiring all highway-user tax revenues to be used for highway purposes was overwhelmingly approved by Massachusetts voters in the November election, making that state the 21st to prohibit diversion of high revenues to other purposes.

West Virginia voters ratified by a three to one majority a constitutional amendment providing for the issuance of $50 million in bonds to build farm-to-market roads. The State Road Commission of West Virginia estimates that 2,500 miles of secondary roads can be improved, and 3,000 miles of new roads can be constructed over a 5-yr. period with the approval of legislation.

Louisiana voters approved a constitutional amendment raising from 5 to 5½ cents the part of the 9-cent gasoline tax earmarked for highway purposes.

Voters in Rhode Island approved a general election proposal to authorize a $3 million bond issue for development of state airports at Hillsgrove and Smithfield over a 5-year period.

City Streets, Bridges Get $15 Million Yearly in Fla.

Florida municipalities are spending approximately $15,500,000 a year on their streets and bridges, according to the findings of a detailed survey made public by the State Road Department.

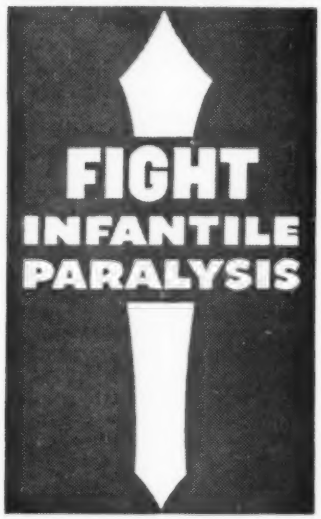
Based on reports from 97.5 per cent of the state's incorporated municipalities for the 12-month period ending May 31, the survey showed that the cities and towns spent $15,416,000 out of an available $19,394,000 for bridges and streets.

State Road Chairman F. Elgin Bayless pointed out that this was exclusive of the money spent by the state on constructing and maintaining links of the state road system within municipal limits. He said the State Road Department did not have a breakdown between its rural and urban projects. Largest item among city expenditures, Bayless said, was for bonded indebtedness. Cities participating in the survey reported they spent $6,484,973 in principal and interest on outstanding bonds, compared to $5,684,325 for construction and $3,396,177 for maintenance.

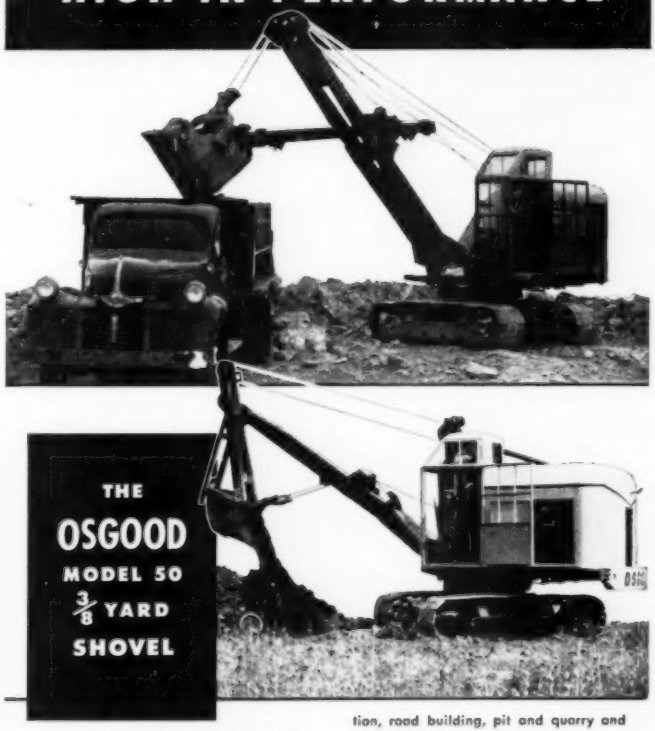
The participating cities also reported a total bonded indebtedness of $100,634,266 for street improvements with all present bonds to be retired by 1984.

Continued on page 64

March of Dimes Jan. 14 to 31



LOW IN COST...
HIGH IN PERFORMANCE



A rugged, versatile, and dependable performer at low cost—that's the OSGOOD Model 50. Its simplicity of operation, easy maneuverability, and full convertibility to all attachments provide outstanding performance in the construction, road building, pit and quarry and industrial fields.

Available as shovel, crane, hoe, dragline, and clamshell. Equipped with OSGOOD patented wire rope crowd and automatic retract.

Write for complete details.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. O-G THE GENERAL CO. EXCAVATOR

MARION OHIO

DIESEL GASOLINE OR ELECTRIC POWERED • ¾ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

Equipment You Ought to Know About

Cable-Controlled Earthmovers

Manufacturer: Wooldridge Manufacturing Co., Sunnyvale, Calif.

Claims: The BB-85 and BB-120 four-wheel scrapers, new models of cable-controlled earthmoving equip-

ment, offer a wide, unobstructed front apron opening of 60 inches, featuring rear-draft fulcrum leverage and pivot-tilt bowl. The BB-85 has a capacity of 8.5 cu. yd. struck and 11.0 cu. yd. heaped, while the BB-120 carries 12.0 cu. yd. struck and 14.2 cu. yd. heaped. Cable is reeved in straight lines without reverse bends. It is said that shorter wheelbase insures quick turning in crowded quarters. All sheaves are mounted away from dirt and load.

Torque Converter

Manufacturer: Detroit Diesel Engine Division, General Motors Corp., 13400 West Outer Drive, Detroit 28, Mich.

Claims: A torque converter and fluid coupling unit specifically engineered to the General Motors Series 71 two-cycle diesel engine is being announced. Consisting of four major elements—a pump, turbine, and two stators—the unit produces torque multiplication of up to 4 to one.

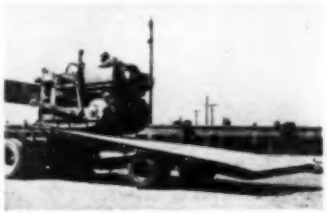
According to manufacturer's claims, by employing the flywheel as a working component of the torque converter assembly, the complete integrated power plant occupies no more space than the same engine equipped with the conventional clutch and power take off.

The unit combines the features and advantages of both torque converters and fluid couplings. It is said to be able to pick up load with maximum lifting power and shift automatically from torque converter to fluid coupling principal in the higher speed range. The unit provides transmission of power during periods of light load conditions by automatically changing over to the fluid coupling. The fluid circuit prevents the engine from stalling under any load conditions and at the same time protects the driven machinery as well as the engine from sudden shock caused by heavy obstructions. The possibility of cable breakage should be substantially reduced by this cushioning effect. The new engine-torque converter combination is made available by Detroit Diesel in the Single 3, Single 4, Single 6, Twin 4 and Twin 6 Series 71 models having engine ratings ranging from 75 to 300 hp.

Tilt-Type Trailer

Manufacturer: Foster Trailer Co., 2029 Sacramento St., Los Angeles 21, Calif.

Claims: Tilt-type trailers claimed to enable a trailer and flat bed truck to be loaded with equipment in less



than 12 minutes without the use of special loading ramps, are now available.

These new trailers feature automatic cribbing brakes to prevent movement of the trailer while loading, an automatic hydraulic tilting control cylinder to allow the trailer bed to tilt gently under loads, and loading-aid hooks which are placed in recesses on the truck bed to help in moving the equipment across the trailer to the truck bed.

The new trailers are available in two primary types, tandem and single axle, in fourteen production models and in special designs.

Compaction Roller

Manufacturer: R. G. LeTourneau, Inc., Peoria, Ill.

Claims: The Tournapacker 144, a new compaction roller, it is said, utilizes all the power of the towing unit. It is claimed that the Tournapacker gives required compaction in fewer

passes because of the wide range of compaction pressures which are available. Ground pressure can be varied from 218 to 670 psi by filling the drum with water and loading attached boxes with sand.

The self-cleaning feet of the Tournapacker—144 feet on a drum—are made of tool steel forging, tempered glass hard. They have a square base which tapers off to a round tamping surface of eight square inches. This two-drum unit is of box-beam construction and rolls on heavy-duty dust- and water-proof bearings.

Ball Bearing Swivel

Manufacturer: General Machine and Welding Works, 1100 East Second St., Pamona, Calif.

Claims: Twist and line unlaying in wire rope can now be eliminated through use of Miller annular ball bearing swivels. It is said of this product that because of the reaction from the Miller annular thrust swivel, loads arrive at their destination in almost the same position as they leave the point of origin.

One model is the Miller Whip Line Special. The manufacturer claims that its weight (32 pounds) is great enough to return a whip line to the ground when using a long boom. Even under a 77,000-lb. load, it is said that this Miller Swivel can be turned by grasping it with the thumb and forefinger. Further claims say that because it is constructed of two female ends (clevises), a Miller Whip Line special does not have to be removed should a crane

Every "CATERPILLAR" Distributor is a HYSTER Tractor Equipment SERVICE STATION

The sun never sets on service facilities for Hyster Tractor Equipment. More than 350 "Caterpillar" distributors, dealers and their branches around the world sell and service Hyster Tractor Equipment. Factory-trained mechanics, genuine parts, experience and know-how are ready when needed.

For nearly 20 years Hyster has specialized in quality tractor tools. The Hyster line includes towing winches; yarders; donkeys; cranes; logging arches; sulkies; and the Hystaway, a combination dragline, clamshell and crane.

Whenever you see a big yellow "Caterpillar" track-type tractor, the chances are that a Hyster tractor tool is mounted on it — speeding work production and reducing job costs. Write for literature.

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HYSTER COMPANY

MANUFACTURER OF 29 TOOLS FOR "CATERPILLAR" TRACK-TYPE TRACTORS

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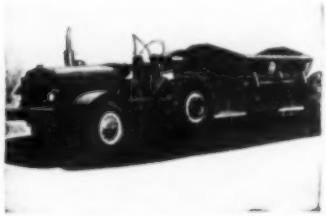
Contact your "Caterpillar"-Hyster Distributor for Sales and Service

operator desire to use a two or more ply line on a block. By bicketing the swivel to the end of his boom he is provided with a free, non-twisting working line. The patented design of Miller Swivels makes possible the use of the entire bearing surface of three ball races, enabling the swivel to carry the maximum load for the smallest diameter and length possible.

Side Dump Trailer

Manufacturer: Euclid Road Machinery Co., Cleveland, Ohio.

Claims: The new Model FDT-98W Side-Dump Euclid has a trailer body



of heavy welded construction for hauling rock, ore and heavy excavation. Its payload capacity is 40,000 lbs.; struck, 13 cu. yds. Down-folding side gates open automatically by mechanical linkage when body is raised by hydraulic twin hoists. Either right or left side dumping can be selected by operator according to job requirements. Ability to dump the load nonstop over the bank or edge of the fill makes this unit useful for mine, quarry and other off-the-road hauling of heavy material. The Euclid tractor is powered by a 200 hp diesel engine and provides a top speed loaded of 33.4 mph.

Elevator Bucket

Manufacturer: Pekay Machine and Engineering Company, Chicago 2, Illinois.

Claims: A new self-cleaning elevator bucket has just been introduced. Its big feature is an independent "Ejector Plate" which serves as the back of the bucket, but which is attached to the elevator belt by an entirely separate mounting than that used for the bucket itself. The passage of this mounting over the radius of the head pulley moves the "Ejector Plate" in a sweeping action which dislodges the contents of the bucket.

The new bucket is constructed of 3/16-in. steel plate, and is available either with or without reinforcement lip. Installation is said to be easy, without major change in the elevator itself.

Cable Cutter

Manufacturer: Pell Cable Cutter Co., 55 New Montgomery St., San Francisco 5, Calif.

Claims: A new-model wire rope cutter with a maximum capacity of one and one-half inch wire rope has just been introduced. Called the Hydrashear Model "LC," the new unit weighs only 70 pounds and can be operated in any position.

Manually operated, the all steel device is entirely self-contained, and does not have to be anchored when in use. It cuts wire rope through the application of hydraulic pressure.

Trenching Machine

Manufacturer: The Everett Manufacturing Co., Inc., Phoenix, Ariz.

Claims: According to the manufacturer, the new Everett trenching machine will equal the pick and shovel work of twenty-five men, and is expressly suited for digging housing project foundations; irrigation lines; water, gas, electric and sewer lines.

This new trencher has cast steel digging buckets, with adjustable clearance teeth, and digs from 12 to 18 inches in width. The unit can be set to cut any distance down to 42 inches deep, and it travels from 1½ to 5 feet a minute depending upon the depth and width of cut and type of soil.

Hard-Facing Alloys

Manufacturer: Stoody Co., Whittier, Calif.

Claims: Two new hard-facing alloys, Stoody self-hardening 21 for applications involving extreme abrasion with moderate impact, and Stoody 1027 for severe impact with moderate abrasion are recommended for tractor parts, power shovels, crushers, impellers, mechanical loader lips and similar equipment.

Stoody Self-Hardening 21 is a high alloy of fabricated tubular construction with alloys including chromium, manganese, silicon, carbon and zirconium. It is primarily recommended for downhand application. Furnished bare and coated, its approximate Rockwell "C" hardness of deposits is 55.

Its welding characteristics according to the maker, include fast deposition rate; AC-DC application, straight or reverse polarity on both bare and coated rods; ready bonding with all steels, manganese and cast iron; and application possible in any bead type, multiple passes.

Stoody 1027 has a mild steel core wire with all alloys contained in heavy, extruded, graphite type coating. Approximate Rockwell "C" hardness of deposits is 45. Among its reported welding characteristics are exceptional weldability on both AC-DC machines, dense deposits, freedom from surface checks, fast deposition rate, deposits forgeable at red heat and multiple deposits without slag chipping.

Both alloys are in the low-cost group and each has been field-tested for a year.

Road Grader Tires

Manufacturer: Pennsylvania Rubber Co., Penn-Craft Park, Jeanette, Pa.

Claims: A new line of Road Grader tires with an extra heavy cord body and especially compounded tread and shoulder rubber has just been announced. According to the manufacturer, the heavy cord body will stand hard usage given this type of tire by contractors and road builders, and that the new tread and shoulder rubber gives increased resistance to cuts and snags.

The new line is available in all sizes and plies from 900-24 through 1300-24 in the vacuum cup cleated type and in sizes 700-24 through 900-24 in the rib type.

Four-Wheel Drive Payloader

Manufacturer: Frank G. Hough Co., 708 Sunnyside Ave., Libertyville, Ill.

Claims: The new Model HM Payloader features four-wheel drive and a power-boosted steering mechanism. It has a bucket capacity of 1½ cu. yds., a static loading capacity of 6,000 lbs., 76 hp engine, 14.00-24.00 road builder

tires on all four wheels. Top speed is 16 mph. Both the bucket-raising-and lowering and bucket-dumping-and-closing are accomplished by double-acting hydraulic rams, fingertip controlled. The bucket booms are so designed that an automatic digging action is given

It's easy to spot a winner

Take these two young "experts". They've spotted one in the 15-B dragshovel. The way it consistently makes smooth, big-load passes is one of the reasons why the 15-B is tops in the ½-yard class.

And if the youngsters follow the machine around, they'll see plenty of other reasons too . . . substantial performance reasons like quick convertibility to other front ends, outstanding output with any front end, and low maintenance requirements.

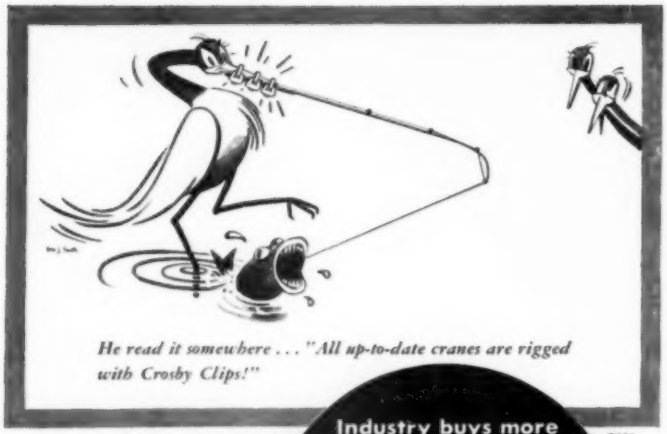
So take a tip from the "tots" — look into Bucyrus-Eries. You'll find they're your best buy for substained high production in dirt or in rock.

BUCYRUS ERIE

The BEST buy Bucyrus, the best BUY in excavators

Bucyrus-Erie Company

South Milwaukee, Wisconsin



He read it somewhere . . . "All up-to-date cranes are rigged with Crosby Clips!"

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9901

Fasten wire rope with CROSBY CLIPS. Safe, simple, speedy . . . applied anywhere by one man with one wrench. *Drop-forged*, not cast. Hot dip galvanized. All sizes . . . for ⅛" to 3" wire rope. Distributors everywhere; made only by AMERICAN HOIST AND DERRICK CO., St. Paul 1, Minnesota.

ALSO MAKERS OF THE AMERICAN HANDIWINCH AND AMERICAN BLOCKS AND SHEAVES

to the bucket independent of the forward motion of the tractor. Also, an automatic quick tip-back of the bucket is provided as it is raised so that heaped loads can be retained without spillage and can be carried low for machine balance and full operator visibility.

Height of the machine is low so that it can travel and work in low overhead locations. It is designed to dig, load trucks and other vehicles, to spread, level, strip, skim, carry and bulldoze, to charge hoppers and conveyors, plow and load snow, to lift and push. Bulldozer blade, crane hook and snow plow attachments will be available for this new Payloader.

Primary Portable Crusher

Manufacturer: Pioneer Engineering Works, Minneapolis 13, Minn.

Claims: A new giant size portable primary crushing plant, 153 PR, has a 3042 overhead eccentric jaw crusher with a 42 in. x 14 ft., three-chain apron feeder, mounted on a three-axle chassis equipped with 12-12.00x20 pneumatic tires. A 30-in. x 25-ft. built-in conveyor delivers crushed material over front end of plant. A bolster for front wheels can be removed to permit use of a semi-trailer hitch for moving, if desired.

You Can't Beat Welded Construction

WELLMAN

Williams Type **BUCKETS**

● Wellman pioneered **welded rolled steel construction** for longer life and greater service. It's the extra strength that gives the extra, low-cost digging power. Whatever your requirements . . . whether for Multiple Rope, Power Arm, Dragline, Power Wheel or Special Service—specify Wellman! ⅜ to 16½ yd. capacity.

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THE WELLMAN ENGINEERING COMPANY

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The overall length of the plant is 40 ft. 6 in. Weight without "on plant" power unit is approximately 79,000 pounds. Power required for operation is 125 hp continuous. The feeder can be raised or lowered readily by means of two hydraulic rams actuated by a single Blackhawk pump.

Earth-Shock Acceleration Detector

Manufacturer: General Electric, Schenectady 5, N. Y.

Claims: An "earth-shock acceleration detector," which measures the intensity of explosion shock waves passing through the earth, is about the size of a small tin can. The new device can be buried near the scene of test explosions, enabling engineers to determine the underground velocity and acceleration of shock waves caused, for example, by use of high explosives on large construction projects. It is said the instrument can register shocks up to 1500 times the force of gravity, and as many as 10,000 impulses per second.

Detectors are "custom built," in each different case, the specific design of the detector being determined by the individual application for which it is to be used.

Arc-Welding Electrodes

Manufacturer: General Electric, Schenectady 5, N. Y.

Claims: Four new electrodes, types W-60, W-61, W-62 and W-95, developed for use in a wide range of arc-welding operations have been announced. The type W-60, designed with a low-hydrogen coating, manganese-moly analysis, and good usability characteristics, is suitable for welding most hardenable steels where the hazards of under-bead cracking are to be eliminated. The range of weldable materials includes low-alloy, high-sulphur, high-carbon, high manganese, and similar high-hardenable and high-tensile steels.

Type W-61, a low-hydrogen electrode of a moly-vanadium composition, can be used with either AC or reverse polarity DC to weld a wide variety of low-alloy steels. It is especially suited for welding low-alloy pipe, including carbon moly and chrome-stablized carbon moly and new varieties of pipe considered "high tensile."

A low-hydrogen, titania-coated electrode of 2½ per cent nickel composition, the type W-62 can be used on

HALL-SCOTT ENGINES
haul bigger loads faster

Operators with BIG loads to haul . . . in rough, off-highway work . . . find the right combination of power, dependability, and speed in the Hall-Scott Series 400, the most powerful truck engine in service.

This engine develops high torque at low r.p.m.—and maintains that torque throughout the normal operating range of the truck. This means *more* power for upgrade heavy hauling . . . less wear-and-tear on the engine. Hence, lower maintenance costs.

For original equipment or re-powering, get the facts on Hall-Scott. Gasoline or butane equipped.

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steel castings of a similar analysis and for producing weld deposits having high impact properties at sub-zero temperatures.

Designed to deposit extremely hard wear-resisting weld metal in all positions, using AC or DC, the type W-95 is suitable for surfacing dipper teeth, drag line bucket lifts, tractor cleats, roller crusher teeth, impeller crane hooks, sand pumps, and sizing screens.

Rear-End Power Shovel

Manufacturer: Stockland Road Machinery Co., 2653 34th Ave., Minneapolis 6, Minn.

Claims: A special hitch for the Stockland Hydro-Scoop, a reversible rear-end power shovel for hydraulically equipped tractors, now adapts it to fit International's new model C tractor. The hitch was designed to make it easy for the operator to mount or dismount the scoop without removing the drawbar.

The Hydro-Scoop, which also fits International H or M as well as Ford, Ferguson, John Deere A or B and Leader tractors, is a 10-cu.-ft. shovel that uses hydraulic power to scoop or shovel, lift, carry and dump earth and other bulky products. The reversible feature enables the shovel to get in close to buildings, fences, feed lot corners, stock piles, banks or dropoffs.

Loads can be dumped in a pile or spread and leveled. The shovel takes a bite 24 inches deep in such materials as dirt, coal, sawdust, sand, snow, grain, fertilizer and refuse.

One-Man Crane Carriage

Manufacturer: Six Wheels, Inc., Los Angeles 11, Calif.

Claims: According to the manufacturer, the new Maxi three-axle close-coupled crane carriage has a removable rear section of frame to provide for close-up digging operations. It boasts one-man operation; all controls operated from crane operator's position in cab. It has a rubber-tired rig for any crane or shovel, ranging in size from five to 30 tons in lifting capacity, or with ⅜ to 1½ cu. yd. shovel capacity. Claims include travel speeds up to 15 mph under own power with same speeds in either direction; short turning radius, and special drawbar arrangement for towing crane with tractor truck, eliminating need for trailer when moving long distances at higher speeds.

All-Wheel Drive

Manufacturer: Marmon-Herrington Co., Inc., Indianapolis, Ind.

Claims: A new line of heavy-duty All-Wheel-Drive converted Ford trucks, identified as the "Q" Series have just been announced. Six models in the new series include three models with 4-wheel-drive, three with 6-wheel-drive. Gross vehicle weight for 4-wheel-drive models is 21,500 pounds, for 6-wheel-drive models, 35,000 pounds. Wheelbases range from 136½ inches to 220 inches.

With live power and traction in all wheels—front wheels pulling, rear wheels pushing—trucks in this series are said to have tractive power needed to transport peak loads through deepest mud, sand or snow, up steep hills and mountain grades.

In converting Ford F-7 models to this series these changes were made: Original front axel assembly removed and new front driving axle installed; new two-speed auxiliary transmission installed, providing a total of ten forward speeds and two reverse; on 6-wheel-drive models, frame lengthened and reinforced and a third driving axle and wheel assembly installed.

Drill and Cutter Bits

Manufacturer: Firth Sterling Steel & Carbide Corp., McKeesport, Pa.

Claims: Development of a new line of drill and cutter bits tipped with Firthite sintered tungsten carbide for use in coal mining has been announced. The line includes Firthite-tipped drill bits, cutter bits, finger bits and percussion bits.

Firthite sintered tungsten carbide is a hard alloy made by powder metal-

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DIPPER
CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

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AMERICAN STEEL DREDGE CO. INC.
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DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

BUCKETS WEARING THIN?

REPLACE LOST METAL with

MANGANAL

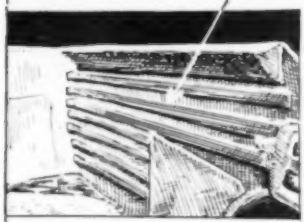
(Trade Mark Reg. U. S. Pat. Off.)

11-13½% MANGANESE-NICKEL STEEL

HOT ROLLED

FLAT APPLICATOR BARS

Interior of 9 yd. Stripping Dragline Bucket Relined With MANGANAL 4" x 1" FLAT APPLICATOR BARS



1. Tensile strength up to 150,000 p.s.i. — lighter sections can be used, increasing bucket pay loads.
2. Becomes harder (up to 550 Brinell) as going gets tougher — will far outlast other steels.
3. Easily fabricated — not harmed by heat of welding or flame-cutting.
4. Strongest welds to Manganese or Carbon Steels easily made with MANGANAL SPECIAL TITE-KOTE or BARE electrodes.
5. Fast, economical — more pounds of metal replaced per man hour. Available in 20 sizes.

FREE: The "MANGANAL MARKETER" offers Helpful Hints on welding 11 to 14% Manganese-Nickel Steel. Write for your copy today!

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STULZ-SICKLES CO.
SOLE PRODUCERS
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lurgy and when used for tool tips and cutting edges is said to display remarkable resistance to wear.

The newly developed cutting machine bits are fabricated for ordinary cutting or heavy duty. The Firthite tips are brazed into a shank of drop forged, heat treated steel.

The auger drill bits are of the two-pronged type designed especially for high speed drilling. One style of this bit was developed for use where a core forms in drilling, such as in anthracite coal, clay and certain rock formations. The finger bits with Firthite tips are designed for use in strip mining.

Hand Riveter

Manufacturer: United States Asbestos Division, Raybestos-Manhattan, Inc., Manheim, Pa.

Claims: The addition of a Gray-Rock industrial hand riveter to a line of brake relining equipment has been announced. It is used for riveting brake linings to brake bands and brake shoes, either internal or external type such as used on shovels, cranes, draglines and other heavy duty industrial machinery.

Suitable for handling linings up to 10-in. in width using No. 7, No. 8 or No. 10 Series tubular rivets, the new hand riveter handles any length rivet up to 2-in. long. It fits into a metal case measuring approximately 12-in. long, 6-in. deep and 3-in. high.

The riveter and carrying case comes equipped with 3/16-in. and ¼-in. roll sets, ⅜-in. and ½-in. anvils, 3/16-in. and ¼-in. drills, ⅜-in. x 3/16-in., ½-in. x 3/16-in., and ½-in. x ¼-in. counterbores fitted with depth gauges to control depth of countersink, six "C" clamps and one wrench.

Impact Tool

Manufacturer: Ingersoll-Rand Co., 11 Broadway, New York, N. Y.

Claims: The 8U, a new and heavier model of the Ingersoll-Rand all-purpose electric impact tool, is reported to be useful for machinery maintenance as well as construction work.

With standard accessories, the new model is rated to run and remove nuts up to ⅝-in. thread size, drive and remove studs, extract broken cap screws and studs, apply and remove machine screws of all kinds, run wire brushes, drill steel, brick, and masonry, tap and ream. It may also be used for woodboring.

The new tool is 12⅛ inches long and weighs 9 lb., 13 oz. It is available for either 110 or 220 volt current and operates on AC or DC.

50 m.p.h. HAULS
Without excessive tire wear!

New La Crosse DF6C
easier on tires...easier
on frame...easier on
equipment you are hauling

THIS new LaCrosse spring-mounted tandem axle trailer lets you move big loads at 50 m.p.h. — with no more tire wear than you get at 20 m.p.h. with ordinary, solid axle trailers. Lessens hazards of overloading . . . permits more trips per day at higher profit for you. Also eliminates punishing jolts when loading crawler equipment. Choice of 19, 24, 27 or 33-ton capacities . . . flat, drop or low-drop models . . . all necessary accessories.

Spring-mounted for a Smooth Ride

2 H-beam axles, supported by 2 heavy-duty alloy steel springs, cushion road shocks, keep DF6C platform and equipment riding level over bumps. Axles and springs, connected by double Y-shaped brackets, absorb brake torque and assure positive wheel alignment at all times. LC-1

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☐ Rush complete facts on new 19 to 33-ton spring-mounted trailer.

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LaCROSSE
Low-Cost TRAILER TRANSPORTATION

Warragamba Dam

Continued from page 26

pipelines, utilizing Megarrity's creek as a spillway, were followed. The war caused a shortage of men and materials, work finally stopping in May, 1943.

During this suspension in construction, geologists examined the river further to discover that the more ideal place for the main dam was 4,150 feet further upstream. The top of the Narrabeen sandstone, a rock under the river bed in the area, is 70 feet higher here than at the original site, and 150 feet of this solid fine-grained sandstone exists here from that level downwards.

Change Pipeline Specifications

At the original site, the jointing of rocks meant the possibility of leakage, and a 25-ft. band of shale on top of the Narrabeen sandstone would have been a source of weakness to the dam. The walls of the gorge are also close together at the new site, saving £2,000,000 ($8,000,000) on the amount of concrete necessary.

During the work suspension period, large pipelines of dams in other parts of the world were studied. As a result new specifications were designated for the part of the pipeline not already put down. When completed, it will consist of 2.6 miles of two 106-in. nominal bore pipe from the dam outlets to the eastern bank of the Nepean River, 14.5 miles of 84-in. pipe and .1 mile of open channel in reinforced concrete 7 feet wide by 9 feet deep at the discharge end of the main, Prospect Reservoir.

By Aug., 1947, nearly all of the excavation for the pipeline had been completed. A rearrangement in the pumps at the weir pumping station will make it possible to deliver 120 mgd to Prospect while the main dam is being built. Hume Steel, Ltd., and Mephan Ferguson (N.S.W.) Pty., Ltd., hold the pipeline contracts.

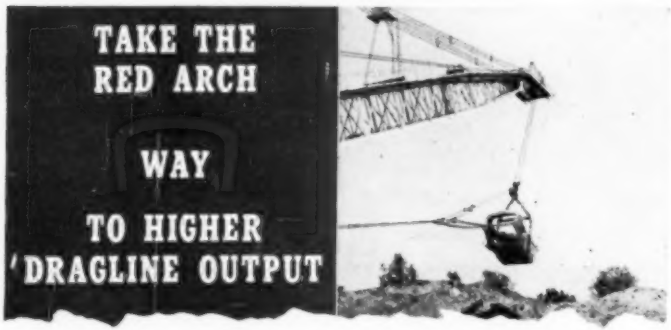
Ropeway Carries Aggregate

The wall of the dam will require about 1½ million cubic yards of concrete, amounting to 2½ million tons of aggregate. This tremendous quantity of material must be carried 12.3 miles from the gravel and sand deposits on McCann's Island on the Nepean River at Emu plains. The Metropolitan Water Sewerage and Drainage Board of Sydney, which is building Warragamba Dam, decided that a bicable (overhead ropeway) would be the easiest and most economical way to carry the aggregate to the damsite.

The ropeway, now under construction, will consist of two sets of cables, one an outward and return heavy track, or carrier cable; the other, light traction or haulage ropes. Both will be suspended from steel towers, 20 to 120 feet high, anchored in concrete foundations. The average span between towers will be 340 feet, the longest one over the Nepean River, 1,080 feet. The two cables will be 11 ft. 6 in. apart.

Four Angle Stations

The one-yard buckets which will carry the aggregate will be run along a route divided into four angle stations located where the topography makes it necessary to change the course of the ropeway. The rise from the loading to the unloading terminal is 522 feet. The normal traveling speed along the ropeway will be 510 feet per minute along the first three sections, 330 feet along section four. The



Don't let inferior bucket equipment hobble your machines . . . fit them out with Bucyrus-Erie Red Arch buckets and watch their output soar.

Strongly constructed, capable of years of hard excavating service, these buckets — in sizes from ⅜ to 25 yards — can bring faster digging, smoother carrying, and easier dumping to your job.

FASTER DIGGING is made possible by the proper angling of bucket teeth and cutting edges for more effective digging action and by the high arch which permits heaping loads on every pass.

SMOOTHER CARRYING is a result of scientifically designed bucket balance. This prevents bobbling . . . reduces spillage during the swing . . . enables Red Arch buckets to carry their full rated capacity in almost any material.

EASIER DUMPING comes naturally to Red Arch buckets. Their smooth, rounded inside surfaces offer no projections or corners for dirt to stick to . . . the high arch that lets material in easily, lets it out in a hurry too.

Check the Bucyrus-Erie Red Arch buckets now . . . let them prove to you that the Red Arch way is the way to higher output for your draglines and higher profits for you.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

BR67C

buckets will be 247.5 feet apart on the first three, 160.5 on the fourth. The time spacing between them will be 29.1 seconds. Loading and unloading will be completely automatic.

The whole of the ropeway, which will have a capacity of 170 tons, will be under a master controller located at the angle station nearest to the dam. The ropeway can be started only through this master controller but it can be stopped by push buttons at all angle stations and on trestles at approximately ¼-mile intervals along the ropeway.

Erection of the ropeway being done by Perry Engineering Co., Ltd., of South Australia in association with the British Ropeway Engineering Co., Ltd., of London is a huge construction project in itself. Perry Engineering also holds the contract for the two cableways which will place the concrete in position. The bicable contract amounts to £393,454 ($1,573,816); the cableway contract for carrying the concrete £191,980 ($767,920).

New Spillway Selected

Moving the damsite up the river eliminated the possibility of using Megarrity's Creek for a spillway. The passing of water directly over the central 290-ft. wall was the final selection. The maximum flood has been estimated at 500,000 cfs, requiring a depth of 40 feet of water over the crest. The flanks of the dam will be R.L. 434 feet, founded at the central length of Narrabeen sandstone at approximately R.L. 20 feet.

Two coffer dams will also be built to dewater the area over which the dam will be built, one upstream, the other downstream from the dam. A diversion tunnel, 14 feet by 18 feet being excavated on the eastern bank, will pass up to 3,600 cfs around these coffer dams. A diversion tunnel was also built on the western bank around the original weir, permitting the coffer dams, especially the downstream one, to be kept at a lower height.

To house the men who will work on the dam, a small township is being built, complete with cottages, stores, water supply, sewerage, electric lighting, churches, schools, and town hall. Eight hundred men will live in barracks that are modern in every respect.

Six hundred families will live in the township cottages. Altogether, about 3,500 persons are expected to be living in the township while Warragamba Dam is being constructed.

Here's a Better-than-New Idler for $25.96

This is how P&H Hartop hard-surfacing electrodes cut equipment downtime, raise man-hour production, reduce maintenance costs

Here's an idler that is being hard-surfaced with P&H Hartop so that a tractor can get back to work in a hurry. The cost of doing this particular job is only $25.96, counting both labor and electrodes.

And that's the beauty of Hartop. It helps you make repairs quickly and easily. You don't have to wait for repair parts. Your machinery stays on the job longer. Your man-hour production is greater. You see, worn parts hard-surfaced with these easy-to-use electrodes outwear new parts 2 to 3 times. That is why you get more work done and your costs are lower.

The Hartop series consists of four types of electrodes — with Rockwell C hardness ratings as follows: Hartop Brown, 35 to 40. Hartop Green, 45 to 50. Hartop Red, 50 to 55. Hartop Yellow, 58 to 63.

Maintain and repair with Hartop. $4.25 buys you our trial package of all 4 types of these money-saving electrodes Get a few packages today from your P&H distributor. Or write us for prompt delivery.

P&H WELDING ELECTRODES
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HARNISCHFEGER CORPORATION

HOW TO GET
Larger
BUCKET
PAYLOADS

This new Erie Catalog makes it possible to quickly choose, from the 4 classes of Erie 2-Line Buckets, the right bucket for *your* crane and material. Perhaps your crane can operate a larger bucket, for Erie alloy welded steel buckets result in greater payloads through scientific bucket weight reduction. Remember, that on bucket work, the cost of the crane and the operator all ride on the bucket. Send for this helpful catalog or outline your conditions and our engineers will make recommendations.

Write for Catalog **2L-1**
Today

ERIE
STEEL CONSTRUCTION COMPANY
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New trade literature

Title: **Gravel Plant Booklet**

Subject: Bottom deck feed, a feature of special gravel plants, is concisely explained in a new three-color 12-page booklet. It describes the process in detail with ample illustrations.

Where to Get: Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn., or from any Pioneer distributor (Free).

Title: **Tractor Folders**

Subject: A series of colorful mailing folders present the design and performance details of four diesel crawler tractors. Job shot illustrations, sectional views of the equipment and complete specifications are given.

Where to Get: International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. Ask for Folder A-93-LL on the TD-18, A-92-LL on the TD-14, A-207-LL on the TD-9, and A-206-LL on the TD-6 (Free).

Title: **Frost Action Bibliography**

Subject: This bibliography is the first step in the progress of making a review and digest of published literature on frost heave and frost action in soils. The study is a part of the work assigned the staff of the Research Correlation Service in summarizing present knowledge on major highway problems.

The bibliography contains an alphabetic arrangement of the major divisions of the problem into a classified subject index, and all of the references are listed chronologically with a brief statement of the content following each reference. There is also an author index.

Where to Get: Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C.

Title: **Wire Rope Catalog**

Subject: An attractive Wickwire rope catalog, 8½ x 11, has been issued in celebration of the golden jubilee of wire rope making at the Palmer plant. Inside its hard cover are 186 pages which present a comprehensive collection of charts, tables, drawings and photographs on wire rope. Its three sections discuss the characteristics of wire rope, its applica-

Save Power and Labor On Your Long Haul Digging

This Sauerman Slackline Cableway digs gravel from lake and keeps screening plant supplied with 75 tons an hour.

Sauerman Scraper moves material from wide pit to crusher.

SAUERMAN
CABLEWAYS and SCRAPERS

Your next dig-and-haul job will move faster and pay off in real savings if you use the Sauerman method. With a Sauerman Scraper or Cableway you can reach out across a wide area, digging, hauling and dumping in one operation. Digs under water as readily as in dry earth. Requires only one man at the controls and power consumption is remarkably small, whether electric, gasoline or Diesel. Installation cost is low and maintenance simple.

Let us recommend the right type of machine for your class of work. Send for our illustrated Catalog and tell us about your own problems.

SAUERMAN BROS., Inc.
574 So. Clinton St. Chicago 7, Ill.

tions and descriptions in specific industries, and care and handling of wire rope.

Where to Get: Colorado Fuel and Iron Corp., Wickwire Spencer Steel Division, 500 Fifth Ave., New York 18, N. Y.

Title: **Welding Electrode Catalog**

Subject: This new 40-page electrode catalog has just been announced by Wilson. It contains 50 photographs and diagrams and electrode selector chart, and complete details on all the electrodes in the Wilson line.

Where to Get: Wilson Welder & Metals Co., Inc., 60 East 42nd St., New York 17, N. Y. (Free).

Title: **Dumpcrete Pamphlet**

Subject: A new illustrated pamphlet showing the use of the Dumpcrete body by contractors for hauling concrete without agitation is now available. Action pictures show the Dumpcrete in use on highway, bridge, power plant, public works, and industrial projects.

Where to Get: Dumpcrete Division, Maxon Construction Co., Inc., 131 North Ludlow St., Dayton 2, Ohio. Ask for No. L-102 (Free).

Title: **Drive Chains**

Subject: This 60-page booklet covers information on steel thimble roller drive chains. It contains clearly-outlined illustrations of links in the exact pitch of each. It also lists all work capacity statistics.

Where to Get: The Jeffrey Manufacturing Co., Columbus 16, Ohio. Ask for Catalog 808 (Free).

Title: **Wire Rope and Slings**

Subject: This four-page folder describes the Foster stocks of standard wire rope and slings. Accompanying the folder is a twelve-page inventory listing the exact quantity in stock, complete description and length of each item, and unit prices on wire rope, wire rope slings and assemblies.

Where to Get: L. B. Foster Co., P. O. Box 1647, Pittsburgh 30, Pa. (Free).

Title: **Adams Motor Graders Film**

Subject: A new 16 mm. full-color, sound moving picture, "Adams All-Purpose Motor Graders," has recently been completed.

The movie shows Adams graders at work on a wide variety of road construction, road maintenance, and miscellaneous grading jobs.

Where to Get: The film can be seen by contacting any Adams distributor. For further information, write to J. D. Adams Manufacturing Co., Indianapolis, Ind.

Title: **Excavator Bulletin**

Subject: A new two-color catalog has just been published, which describes the Byers Model "83," ¾-yard excavator. The book contains up-to-date specifications and technical data . . . illustrates possible job applications.

Where to Get: The Byers Machine Co., Ravenna, Ohio. Ask for Form 748 (Free).

Title: **Hard Facing Data**

Subject: A 3-page booklet describing hard facing of mixer arms on concrete and cinder block equipment contains information of hard facing procedures plus sketches showing where to hard face parts.

Where to Get: Wall Colmonoy Corp., 19345 John R. St., Detroit 3, Mich.

Title: **Hauling Equipment Literature**

Subject: Three new pieces of literature

Continued on page 64

4 BIG JOBS
DIGS
TRAXCAVATOR
GRADES
Hold down costs . . . and get the job done quickly . . . with this versatile all-weather equipment. When you TRAXCAVATE, you dig, grade, carry and load with a single machine! TRAXCAVATOR, powered by "Caterpillar" track-type tractors, is available in four sizes. Write, phone or come in today for further information.
CARRIES
LOADS
T. Southworth
GLENWOOD ROAD
TRACTOR & MACHINERY CO.
MENANDS NEW YORK
ALBANY, NEW YORK, TELEPHONE 5-5255

Safety

Continued from page 23

a slope, if possible three or four bowls of dirt should be dozed to the edge of the slope. Then the operator should ride down the slope with his dirt in front of the blade. However, if this dirt is lost on the way down, the operator should not lower the blade to regain the load—this might cause the tractor to overturn. The blade should never be used suddenly as a brake when descending a steep slope.

Before moving a bulldozer or tractor, the operator should make certain that no one is in the "danger area" around the equipment. Best procedure is for the operator to walk all the way around the unit before he starts up.

Only the operator should be on the operating platform or seat while the machine is in use. He should observe this rule rigidly, because his efficiency is affected if the necessarily limited operating space is crowded. Neither should any person be permitted to ride on the drawbar.

• No one should be allowed to step on tracks of moving tractors.

When cranking an engine, the operator should keep his thumb beside his fingers and pull up one quarter turn. It's important to remember to advance the magneto control lever if the engine is cold.

All equipment being towed should be secured by a safety chain in addition to the regular hitch.

The operator should exert extreme care when working equipment near the edges of cuts or fills. He should not only keep a safe distance from the edge but should know where the material will go so that other employees, the public, livestock, and property will not be injured or damaged. The foreman should arrange for sufficient clearance before work starts.

The tractor should be stopped, the shift lever put in neutral, and the brakes set before any employee is allowed to couple up trailing equipment. Wheels of such equipment should be blocked before coupling.

In clearing operations, the operator should be cautioned to expect the greatest danger from falling branches or timber; in general excavation work from overhanging dirt and rocks. In

DOES IT WITH A ROGERS

DOES IT WITH A ROGERS

ECK MILLER
OF OWENSBORO, KENTUCKY

using a Rogers Model D-35-D and a Rogers Pole Type Trailer loaded with 80,000 lbs. of steel tank 67 feet in length. The conventional trailer mounts a fifth-wheel type of bolster which supports the front of the load and tows the pole trailer which carries the rear of the load.

A. B. BURTON CO., Inc.
OF LYNCHBURG, VA.

Moving this heavy Northwest power shovel from job to job presents no problem to the A. B. Burton Co. when they have their D-50-D Rogers semi-trailer to rely upon.

and* YOU CAN DO IT WITH A *ROGERS trailer, whether the jobs involved require the hauling of light, medium or heavy equipment. Why not learn in detail just what Rogers has to offer? Write TODAY for your copy of the NEW CATALOG.

ROGERS HEAVY DUTY

ROGERS BROTHERS CORPORATION
DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS
SINCE 1915
136 ORCHARD ST. **ALBION, PENNA.**

CLOSING POWER *Plus* WHEN AN OWEN BUCKET *Clamps Down*

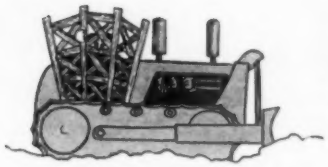
It's the "Plus" features in a product that contribute largely to outstanding performance and build user satisfaction and profits.

Relax and swing an Owen from your boom. Closing Power PLUS is there when required for licking the toughest excavating jobs which will confront you.

OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAY'S WORK

A MOUTHFUL AT EVERY BITE

THE OWEN BUCKET CO. 6095 Breakwater Ave., Cleveland, O.
BRANCHES: PHILADELPHIA • CHICAGO • BERKELEY, CALIF.



• Rail guards should be installed so operator won't be thrown off if machine should tilt suddenly.

many cases, management has made standard equipment on bulldozers heavy, well-supported arched steel mesh canopies to protect the operators.

Look Before Bulldozing

The operator should see that all men are in the clear before pushing over small trees, bulldozing rock, or rolling logs. Dead branches or tops are definite hazards: abrupt contact with the butt of a tree may crack it in the middle or break off a limb that will drop to the tractor top.

Roots of trees should be cut off on three sides, then dozer power applied on the fourth side to push the tree over. A long cable should be used to pull over large dead trees after making sure that the tractor and operator are clear.

Maintenance

Bulldozers and tractors should be serviced on a regular schedule. When an operator leaves equipment for servicing as at the end of the shift, he should make certain that the shift lever is in neutral, brakes are set, and the blade is lowered to the ground, or, if necessary, properly blocked with timbers.

When reeving cable on a drum or through sheaves, the operator should disengage the master clutch, idle the engine, and lock the brakes. He should kill the engine before working with the cable on a front-mounted cable drum.

A scraper should never be operated without a safety cable attached to the pulling unit. Drawbar failure can result in a serious accident without this safeguard. When towing a scraper from job to job, the operator should use a scraper bowl safety latch or place a safety bolt in the pushbeam to give maximum clearance by road projections such as crossings. This precaution will eliminate the possibility of the bowl's striking the ground or pavement in transit and injuring persons or damaging equipment.

Scraper and dozer bowls should always be blocked up when blades are being replaced. After the scraper is lifted to the desired height, blocks are placed under the bottom near the ground plates. Apron arms are raised to extreme height and a block is placed under each arm, allowing the apron to drop enough to wedge each block firmly in place.

When going downhill, the operator should never kick the machine out of gear because increased speed may make control of equipment difficult. He should leave the machine in gear and use his brakes to control speed. If the brakes will not hold the load, the operator should drag the scraper bowl to make an emergency stop.

When loading with the assistance of a push tractor, the scraper operator should co-ordinate his effort carefully with the tractor operators so that no accident will occur.

Operating rules on the job should govern traffic on all haul roads and job roadways. On most jobs the rule is to give loaded equipment the right of way. All workers should be impressed with the importance of this rule.

GATKE "300" CLUTCH DISCS

GATKE makes
BRAKE LINING
CLUTCH FACINGS
CLUTCH DISCS
FRICTIONS

Engineered and Service-Proved for every requirement of Road Building, Excavating and Construction Equipment.

AVOID SUBSTITUTES. If your equipment manufacturer cannot supply GATKE Brake and Friction Materials, write us.

Here are proven advantages of GATKE Type 300 Clutch Discs that provide performance results never before obtainable—

Tremendous Power for Easy Handling and Increased Operating Dependability

Improved frictional qualities that keep uniform throughout the exceptionally great wear life

Extraordinary heat resistance — no let down when things get hot

The many superior qualities are achieved by GATKE-developed methods of combining and moulding Woven Asbestos and Asbestos Moulding Compounds to finished dimensions.

Furnished in Gear Toothed and Plain Disc Types in sizes to 48 inches in diameter and larger.

Gatke CORPORATION 232 N. La Salle St. Chicago 1, Illinois

NOT in the *Contract*

A powder salesman of super ability was nevertheless dissatisfied with life and decided to end it all. He had climbed a bridge railing and was about to jump when a policeman appeared. "Hey!" shouted the officer. "You can't do that!"

"Why not?" challenged the salesman, and went on to argue the point with the policeman. Several minutes later, they both jumped.

Engineer: "Doctor, I don't smoke, drink or chase around with women. Will I live a hundred years?"

Doctor: "No, but it will probably seem like it."

"Which has more legs," asked the little boy, "a cow, or no cow?"

Puzzled, the fond parents did not know, but ventured the guess that a cow had more legs.

"No cow has eight legs," replied the young hopeful.

"Does your husband always live up to his promises of his courtship days?"

"Always. In those days he said he was not good enough for me, and he has been proving it ever since."

Shovel Runner: "See that big substitute down there playing forward? I think he's going to be our best man next year!"

His Date: "Why, Darling! This is so sudden!"

"I tried counting sheep as you advised me," a clothing manufacturer told his partner, "but I couldn't get to sleep anyway. I counted thousands of sheep. Then, before I realized what I was doing, I sheared them, combed the wool, spun it into cloth and made the cloth into suits. But I lost $20 on each suit—and for the rest of the night I lay awake worrying."

"How far is it to the next filling station?" the truck driver asked the farmer.

"Nigh onto two miles as the crow flies."

"Well, how far is it if the crow has to walk and roll a flat tire?"

"Mother, may I keep a diary?"

"Why, yes, dear."

"Then may I do the things to write in it?"

But I've run it three times already, Henry. I don't see why you keep wanting me to try it!

The president of a large construction firm ordered a number of "Do It Now!" signs installed about the company's various projects. In a few days, a paymaster had run off with a $50,000 payroll, a catskinner eloped with a project boss's secretary, and an engineer left for Hollywood to star in the movies.

An Irish panhandler approached a prosperous looking contractor. When he saw the man put his hand in his pocket, the bum explained: "May the blissing of God follow you all of your life!" But when the wealthy one pulled out only his handkerchief, the tramp immediately added: "—— and niver overtake ye."

The small-town contractor went down to the station to welcome his daughter, just returned from girls' college.

"Ain't you a mite fatter than you was?"

"Yes, father," she confessed, "I weigh a hundred and forty pounds stripped for gym."

"Who in thunder is Jim!"

At the start of the shift, the excavating foreman greeted his catskinner with a big smile. "Have a cigar!"

"Don't mind if I do," said the skinner. "Is this a special occasion?"

"I'll say it is!" was the reply. "I've got a new addition to the family."

"Congratulations!" said the catskinner. He put a match to the cigar, puffed on it a few times, and then observed, "About the fifth child, I presume."

"We are now passing the most famous brewery in Berlin," explained the guide.

"*We* are not," replied the visiting American contractor as he hopped off the sight-seeing bus.

Having been married 20 years, a couple decided to celebrate by taking a little trip. While talking over their plans one evening, the husband now and then glanced into the next room where a little old lady sat knitting. "The only thing," he finally said in a hushed voice, "is that for once I'd like to be by ourselves. I'd like to take this trip without your mother."

"*My* mother!" exclaimed the wife. "I thought she was *your* mother!"

COMPARE

THE PROFIT-MAKING FEATURES OF THE 1/3 YARD SCHIELD

BANTAM

TRUCK MOUNTED SHOVEL • TRENCH HOE
DRAGLINE • CLAM • PILEDRIVER • CRANE

VERSATILITY

6 profit-makers in one machine. Convertible in minutes from shovel to trench hoe, dragline, clam, piledriver, crane. Interchangeable split type laggings give high performance on all operations.

MOBILITY

The BANTAM is balanced for mounting on any 1½ ton truck. Drives up to the job and digs in. Saves time where time counts. Ideal for operation in tight spots. Also available on half-tracks.

CAPACITY

Full circle design and fast cycle operation piles up profits. Normal capacity, yards per hour; Shovel or Dragline—60 yards, Trench Hoe—100 feet of 5 ft. ditch.

Write for complete details

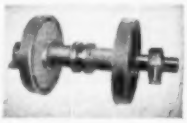
THE SCHIELD BANTAM CO., INC.

202 PARK STREET • WAVERLY, IOWA

These BANTAM features mean longer life, lower maintenance costs, easier operation and more operating hours on the job.

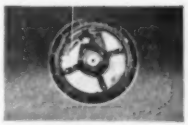
● FULL BALL BEARING MACHINE DESIGN

All major shafts, gears, and drums roll on ball bearings. Means easier operation, greater economy, less downtime on the job.



● SMOOTH OPERATING CLUTCHES

Trouble-free mechanical clutches require least amount of attention, reduce operator fatigue. Drum clutch illustrated is internal expanding, snap-in type. Swing clutches are single disc, snap-in type.



● MODERN HOOK ROLLER DESIGN

Upward pressure when operating is carried by adjustable, solid steel bronze bushed hook rollers reducing strain on center pin and resulting in longer life of turntable roller bushings. Cuts maintenance costs—more profits to you.

● PROTECTED BULL GEAR

Turntable base is one-piece special alloy steel casting with integral bull gear. Inside location of gear protects it from dirt and grit, permits cleaner lubrication.

SOLD AND SERVICED BY LEADING CONSTRUCTION MACHINERY DISTRIBUTORS THROUGHOUT THE UNITED STATES, CANADA, AND FOREIGN COUNTRIES

Notes from the manufacturers

GarWood Industries, Inc., Wayne, Mich., announces two new appointments, that of D. J. Byrd as district manager in the Southeast region, and that of W. E. Toensing as district manager in Virginia, North Carolina, South Carolina and the District of Columbia. Byrd was a salesman at the Washington branch, and Toensing was service manager for the St. Paul division, Minneapolis, Minn., prior to their new appointments.

Athey Products Corp., Chicago, Ill., has appointed G. O. Britton as domestic sales manager and E. B. Schlenk as district representative in the Central territory. Prior to their new positions, Britton was assistant domestic sales manager and Schlenk was employed in the sales division of the Roy C. Whayne Supply Co., Inc., a Caterpillar distributor in Louisville, Ky.

Drake American Corp., New York, N. Y., has appointed Herman B. Robbins as manager of the new Hill diesel engine division. Robbins, formerly in charge of export sales of Hill engines, will now handle all sales activities of the division, both domestic and export.

Barber-Greene Co., Aurora, Ill., announces the appointment of Wilhelm-Davies Co., North Colony Rd., Wallingford, Conn., as exclusive distributor in Connecticut, representing their construction and industrial divisions. They will handle the following Barber-Greene products: bituminous mixing and paving machines, portable bulk material loaders, permanent and portable conveyors, snow loaders, ditchers and coal handling equipment for retail and industrial applications.

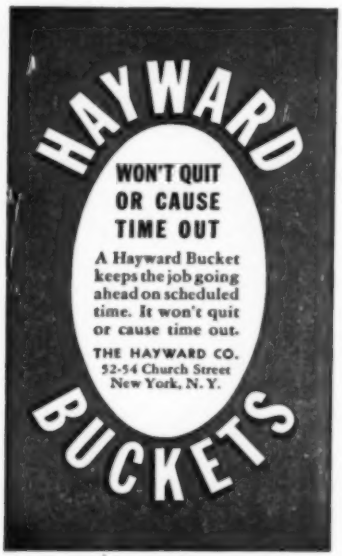
Foster Trailer Co., Los Angeles, Calif., has appointed two new sales heads, Walter W. Harvey, will be in charge of retail sales, while Conrad P. Herman will take over as national sales manager for distributors and dealers.

General Tire and Rubber Co., Akron, Ohio, is announcing the appointment of five new branch managers and the opening of a new branch sales outlet in Richmond, Va. The new branch managers are Earl H. Schaub, Denver; William W. Fergusson, Buffalo; Richard Graybill, New York; John W. Bogle, Richmond, and James J. Flasco, St. Louis.

Caterpillar Tractor Co., Peoria, Ill., has appointed Dale S. Gronsdahl, district representative in Alabama, West Florida and Central Tennessee. He succeeds L. L. Morgan who recently joined the advertising department at Caterpillar.

R. G. LeTourneau, Inc., Peoria, Ill., has named Wendell V. Richards, who has been district sales representative in the New England states as new Central sales manager, with offices at Peoria. He succeeds W. B. Worden, who resigned recently to accept a position with the Noble Co., Oakland, Calif.

Cogmatic Co., 757 N. Water St., Milwaukee 2, Wis., announces a newly-developed process of flame


HAYWARD
WON'T QUIT OR CAUSE TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD CO.
52-54 Church Street
New York, N. Y.
BUCKETS

BLAST HOLE DRILLS THAT SAVE
Bucyrus-Erie blast hole drills make substantial savings for owners because of their fast drilling action, all-steel construction, low fuel consumption, mobility, speedy tool changes, and quick, accurate control. It will pay you to investigate them.
SO. MILWAUKEE
BUCYRUS ERIE
WISCONSIN

ATTENTION:

Army Truck Owners

We have the parts for your army trucks.

Fill out and mail the attached coupon for free "Parts and Price Lists."

Wm. O. Hensley Truck Parts, P.O. Box 747, Phone Crawford 3734, 904 Poplar St., Terre Haute, Ind.

MAIL FREE PARTS AND PRICE LISTS TO

Firm .....

Street .....

City ..... State .....

WE OPERATE THE FOLLOWING ARMY TRUCKS

.....Jeep .....Chevrolet 1½ ton 4x4

.....Dodge ½ — ¾ — 1½ ton 4x4 (Circle Capacity)

.....GMC 2½ ton 6x4 or 6x6 Banjo Type Axle

.....GMC 2½ ton 6x4 or 6x6 Split Type Axle

.....Studebaker or Reo 2½ ton 6x4 or 6x6

.....International M-5H-6 2½ ton 6x6

machining heavy-duty sprockets and gears from steel plate. The firm is equipped to give 48-hr. delivery on most items. The machine can flame machine a 12-in. sprocket in as little time as five minutes with other cutting times varying depending on the diameter, thickness and characteristics of the metal. It operates on the principle of combining two motions, the blank to be cut rotating on a spindle wheel while an oxy-acetylene cutting torch mounted on a torch carriage, moves radially in respect to the blank.

Osgood Co. and the General Excavator Co., of Marion, Ohio have named Frank L. Johnson as division sales manager in Washington, Oregon, California, Nevada and parts of Montana and Idaho.

George Haiss Manufacturing Co., Inc., New York City, N. Y., announces the appointment of S. DeVries as exclusive sales representative for the new Haiss line of material handling equipment in the state of Connecticut. Mr. DeVries' address is P. O. Box 31, Milldale, Conn.

Hyster Co., Portland 8, Ore., has transferred R. E. Stiegle, former district representative for the company, to the general sales department in Portland to handle special sales assignments for the general sales manager.

Mr. Stiegle will be replaced in the southeastern territory by W. R. Hunt, who joins the firm after four years as a retail salesman for a Caterpillar Tractor Company distributor.

The Thew Shovel Co., Lorain, Ohio, has announced the appointment of M. B. Garber, former assistant sales manager and export manager, to the position of general sales manager.

He succeeds the late Don G. Savage who died on July 25th.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date — 15 of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

FOR SALE
2½-yd. P & H Electric Shovel, Model 1225

This shovel has a 3-yard bucket and is in very good mechanical and electrical condition.

Shovel can be demonstrated under power.

Electrical equipment: 3 phase, 60 cycle, 2300 volts.

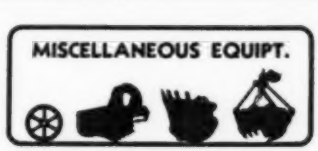
Good selection of new parts to be sold with shovel.

JOHNS MANVILLE PROD. CORP.
Lompoc, California

Northwest 95 3-yd. dragline. Shovels 1; 1¼; 1½ yd. Northwest No. 6.
A. W. Nevers — **Mt. Pleasant, Iowa**

2—50-B steam shovels for sale. For particulars write:
New York Trap Rock Corporation
230 Park Avenue — **New York City 17, N. Y.**

Bucyrus-Erie 10-B shovel, dragshovel and dragline. Also Bucyrus-Erie 10-B shovel, dragshovel, dragline without bucket or fairlead.
Box 3296



1 Reel, new tramway track rope 2" diameter, Leschen Style B, flattened strand mild plow, 575 feet long. Price $519.90 f.o.b. Stearns, Ky. Write c/o Excavating Engineer, Box 3301.

MECHANICS — HOME STUDY. Step up your own skill with facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in handy form. Fully illustrated. Easy to Understand. Highly endorsed. Check book you want for 7 days' Free Examination. Send no money. Nothing to pay postman. ☐ Carpentry $6, ☐ Auto $4, ☐ Oil Burners $1, ☐ Sheet Metal $1, ☐ Welding $1, ☐ Refrigeration $4, ☐ Plumbing $6, ☐ Masonry $6, ☐ Painting $2, ☐ Radio $4, ☐ Electricity $4, ☐ Mathematics $2, ☐ Steam Engineers $4, ☐ Machinist $4, ☐ Blueprint $2, ☐ Diesel $2, ☐ Drawing $2. If satisfied you pay only $1 a month until price is paid.
AUDEL Publishers
49 W. 23 St. — **New York 10, N. Y.**

Shovels — cranes, 1¼, 1½, 1¾, 2, 3, 5-yd. Draglines, 3-yd. diesel, 3½-yd. electric. Buckeye trench excavators, 203, C15A-224. A-C gyratory rock crushers, 30", 27", 20". Jaw crushers: 30" x 42", 28 x 40, 28 x 36, 18 x 30. Pennsylvania hammermill, 27" x 49", SXT-11. Autocar dump trucks (4), 10-yd. gas, 1946. Locomotives, 5 to 52 tons, various gauges. Power plant, steam turbo-electric, 1500 kw. Guiberson diesel engines, 150-200 HP, unused. American 35-ton locomotive crane, diesel. Porter, Vulcan 18-ton steam locos., 36" ga. B-E shovel front att., 2-1/3 yd., 52B-55B.
H. Y. Smith Co., 828 N. B'way, Milw. 2, Wis.

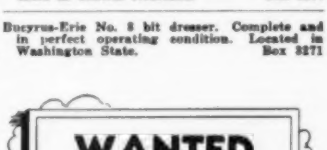
One Pioneer 4209 crushing unit, complete with 40" x 22" roll crusher with hopper 30" x 15', rubber belt conveyor, chain driven, brakes, wheels and axles, 100 H.P. motor recommended. Maximum crushing size 2", minimum crushing size ¼", tons/hr. at 2" size — 291, tons/hr. at ¼" size — 45. Crusher in A-1 condition and priced reasonable for immediate delivery. Located in Ohio. **Box 3302**

USED 18" OR 20" ELECTRIC HYDRAULIC DREDGE. MID-WESTERN LOCATION. BOX 3251

One Bucyrus-Erie 29-T blast hole drill with approximately five years' service; suitable for drilling 6" to 10" diameter holes with 38' steel derrick, full caterpillar mounting and built-in tool wrench. Can be offered with either electric motor for 3 phase 60 cycle, 440 volt power or with gasoline engine drive. Drill in A-1 condition and priced reasonable for immediate delivery. Located in Ohio.
Box 3298

New independent diesel driven electric generating plant, 650 H.P. diesel engine, 420 K.W., 2300 volts, 3 phase, 60 cycle generator, mounted on rubber-tired special trailer. Located in Central Nebraska. **Box 3277**

Bucyrus-Erie No. 8 bit dresser. Complete and in perfect operating condition. Located in Washington State. **Box 3271**



WANTED: High Lift shovels for coal stripping. Box 3284

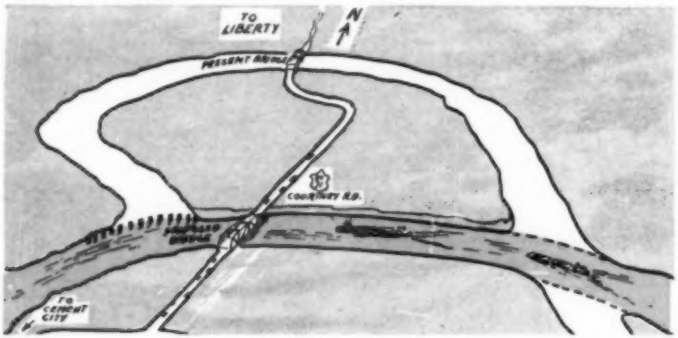
HELP WANTED

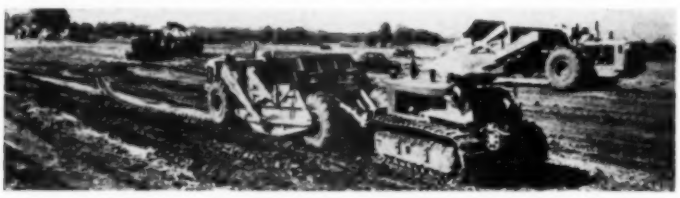
Sales Representatives — Earth Moving Equipment
Large middle western manufacturer of allied equipment for crawler tractors (bulldozers, hauling scrapers) requires sales representatives with sales or construction and experience for work in Northeastern U. S. and Eastern Canada; also Pacific Northwest and adjacent Canadian Provinces. Prefer ages 28 to 35. Work consists of sales contacts with distributors of heavy construction equipment and crawler tractors. Positions afford possibilities of permanent employment and advancement with ability and accomplishment. Reply should include age, educational background, experience and family status. **Box 3303**

News

Continued from page 45

• Bucyrus-Erie 38-B crane with 75-ft. boom removes wood forms from concrete pier for the Liberty cut-off bridge under construction below Kansas City. Massman Construction and Kansas City Bridge Companies, both of Kansas City, hold the joint $4,200,000 contract for the 1884-ft. long bridge which is being built on dry land prior to excavation of a new channel and diversion of the river (sketch below). The article "The River Will Help" in July, 1947 Excavating Engineer described the project which is under supervision of the U. S. Engineer Corps.





• J. D. Barter Construction Co., Harrisburg, Ill., is moving some 625,000 cu. yds. of tight clay in the building of Williamson County Airport, the first of five new Illinois airports under the National Airport Program. A new International TD-24 tractor, used as a pusher has stepped up scraper loading to as much as 18 cu. yds. in 40 seconds, averaging 918 cu. yds. per hour. Here, the big rig pushes a 14-yd. La Plante-Choate TS-300 Moto-Scraper, while another of the same model works in right background. An International TD-18 tractor pulls a 10-yd. Le Tourneau scraper in left background.

New Trade Literature

Continued from page 57

discuss off-the-highway hauling units, complete with photographs, descriptive information and detailed specifications.

Where to Get: Euclid Road Machinery Co., 1361 Chardon Road, Cleveland 17, Ohio.

Title: **Tire Development Story**

Subject: A compact 63-page booklet, with many illustrations, telling "The Story of the Tire," answers questions about where natural rubber comes from and how it is grown, how synthetic rubber is made, and the history of rubber and its uses. One section explains in detail the production of heavy-duty tires.

Where to Get: Public Relations Department, Goodyear Tire and Rubber Co., Akron 16, Ohio.

Title: **Bucket Loader Circular**

Subject: A 12-page circular on heavy-duty bucket loaders equipped with integral swivel belt conveyor discharge is now available. It gives specifications of various models, describes and illustrates the applications of this type of materials loading.

Where to Get: Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill. Ask for Circular SBC-1048 (Free).

Title: **Explosives Booklet**

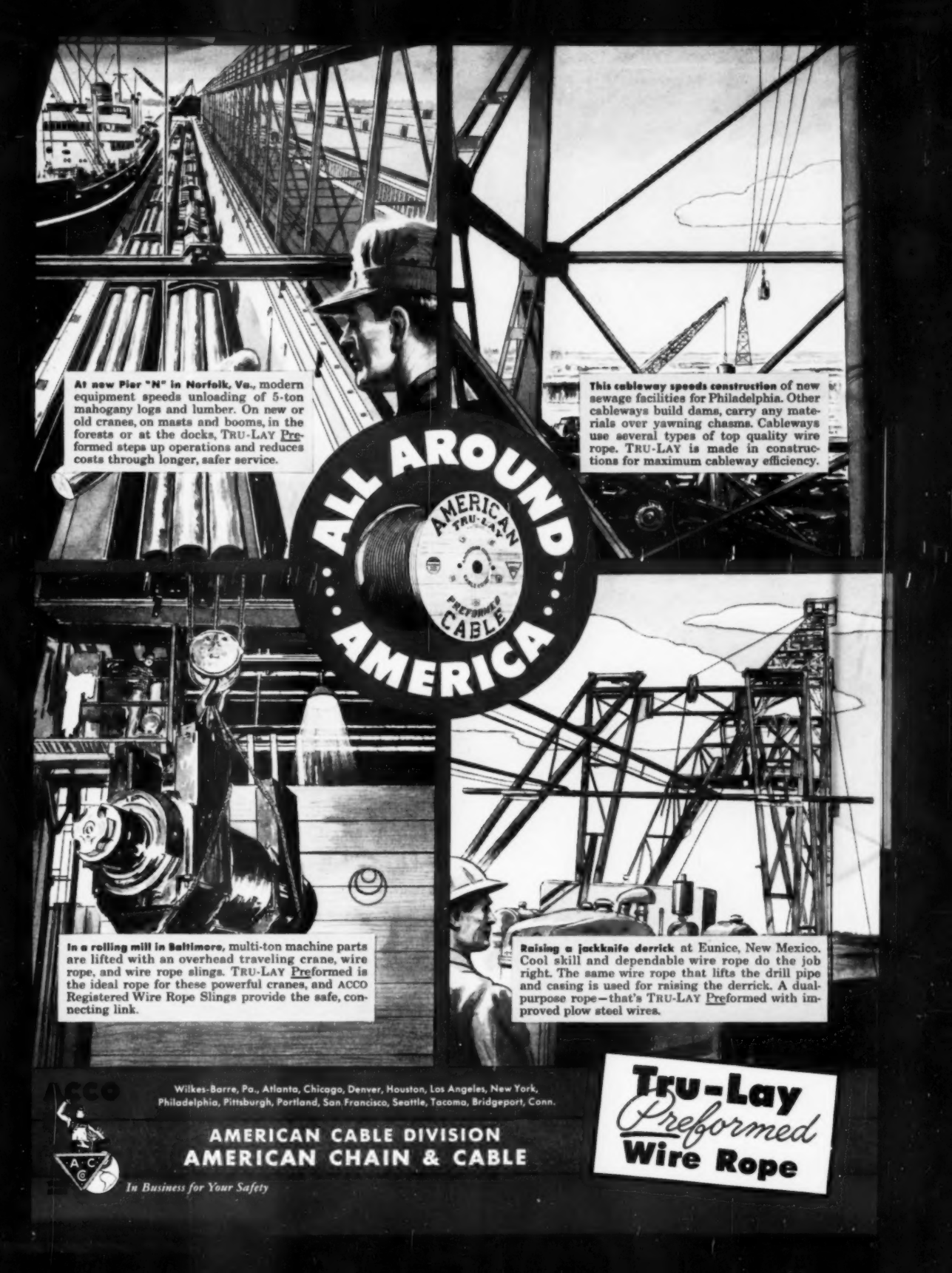
Subject: A 64-page booklet devoted to the use of industrial and mining explosives has been issued. It contains useful information like wire resistance and distance tables, comparisons of weight strength and density, burden on bore holes as well as a list of safety suggestions.

Where to Get: Olin Industries, Inc., East Alton, Ill. (Free).

Title: **Hardfacing Alloys Booklet**

Subject: This new booklet covers the complete line of Airco hardfacing alloys. Profusely illustrated, the sixteen page, two-color book, which also serves as a hardfacing catalog, describes each of Airco's new alloys in complete detail. Included are data on typical uses, specifications, applications, techniques, etc.

Where to Get: Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y. (Free).



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